The Builder.

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ILLUSTRATIONS.

Walsall Municipal Buildings Competition.—Design submitted by Mr. W. A. Pite, F.R.I.B.A., and Mr. R. S. Balfour, A.R.I.B.A.:—
- **Exterior Perspective** ..... *Single-Page Photo-Litho.*
- **Interior of Hall** ..... *Single-Page Photo-Litho.*
- **Elevations and Section** ..... *Double-Page Photo-Litho.*
- **Plans** ..... *Double-Page Ink-Photo.*

Sketch-Designs for Tapestry Patterns.—By Mr. Alfred Carpenter ..... *Double-Page Ink-Photo.*

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Illustrations of Italian Renaissance Ornament.

THE ornamental work connected with Italian Renaissance architecture—leaving out of consideration the immense number of decorative objects which are complete in themselves, and have no connexion with architecture—is such an immense subject that adequate illustration of it in books and drawings is all but impossible, or at all events could only be achieved by a kind of syndicate of artists and publishers prepared to make and issue portfolios of drawings by the thousand, regardless of time, labour, and cost. No single publication could do justice to the subject, because the more we study Italian Renaissance detail, the more we are struck with its great and unexpected varieties. There are types of carved foliage, of capitals, which are familiar to us as essentially Renaissance; and as far as strictly architectural details are concerned, such as capitals, cornices, &c., there is a tolerably close adherence to general types. But in the design of decorative carving and inlay there is such an immense variety of fancy and detail that one never seems at the end of it.

There is, however, a certain prevailing quality in Renaissance ornament which is readily perceived, and which may be defined as representing a combination of Greek delicacy and refinement of design and execution with a freedom which is more mediæval in character. There is something of the severity of line of classic art, combined with a far greater riot of fancy. The Romans suggested idealised animal forms, winged quadrupeds with eagles' heads perhaps, classified as "griffins," or female forms which run off into sumptuous scrolls of foliage; but these were simply and easily grouped elements of decoration compared with the endless and bewildering fancies of the Renaissance artists in the creation of *mélanges* of odds and ends of men, animals, fishes, and grotesque masks, into a system of decoration. With all this eccentricity, however, there is always a sense of style and of harmony of design about this kind of work, which leads one to overlook the grotesqueness of much of the detail in admiration of the general effect. In the use of foliage in ornament, without the human or animal element, the characteristic of the Renaissance ornament is again found to be a singular delicacy and grace of line and execution, reminding one of Greek work, yet with a freedom and an occasional approach to naturalism which is hardly ever found in Greek work. And yet the work hardly ever comes too close to realism. In most of it a distinctly conventional character is preserved, but it is a conventionalism different from, and more free than, that of either Greek or Roman art.

The best modern illustration of these qualities in Italian Renaissance detail is found in Mr. Oakeshott's "Detail and Ornament of the Italian Renaissance," published a few years ago. The examples in this collection have been very well selected; they are mostly typical of the best qualities of design of the period. Nicolai's remarkable collection of photographed examples ("Das Ornament der Italinischen Kunst") brings out still more remarkably the best side of Renaissance detail, and shows moreover how little the most careful and painstaking draughtsmanship avails to convey the true impression of the richness and exuberance of the period of the Renaissance treatment of conventionalised foliage. The finest examples in these two books are to be found in the drawing of the inlaid ornament of a pilaster from Sta Maria dei Miracoli, plate 9 in Mr. Oakeshott's book, and the carved pilasters of San Michele, Venice, in plate 97 of Nicolai's collection. These two show the Italian Renaissance foliage ornament at its perfection; and nothing more beautiful and delicate in the shape of ornament could be found. There is probably much more, equal to these examples, to be found, as yet unillustrated. It is not likely that any one publication could do justice to it—at all events, any publication by one artist. But there must be many sketches of work of this type in existence; sketches at present isolated and unpublished in various portfolios and sketch-books. It would surely be worth while for those who possess such illustrations to arrange together, through some common correspondent, for a joint publication of their various drawings, as a contribution towards the more adequate illustration of Italian Renaissance ornament. In thus consecrating their efforts towards a common object they would be doing a service to art, and especially to architects and decorative artists.

The latest contribution to the illustration of Italian Renaissance work comes in the shape of a folio volume of fifty sheets of drawings, by Messrs. G. A. T. Middleton and R. W. Carden,* who state, as the justification for such a publication, that such works of this kind as have previously appeared are out of print and no longer to be met with. Is this really the case? We should have thought that some books of illustrations of Italian Renaissance ornament were still attainable. In the permanent preface to the book (for the above remark is quoted from the separate announcement sheet) the object is said to be to find as much variety as possible in Italian detail, and that in fact this has been achieved without, it is believed, repeating subjects which have been illustrated elsewhere in English books. This is a better plea, for the wealth of the Italian Renaissance is, as the authors observe, greater than has been yet realised, and it is still possible to draw many things which have not been drawn before; and also to find characteristics of Renaissance detail which are at all events not familiarly known.

The Marsuppini tomb at Santa Croce, which is the subject of one of the

* Ornamental details of the Italian Renaissance, measured and drawn by G. A. T. Middleton and R. W. Carden. London: B. T. Batsford; 1900.

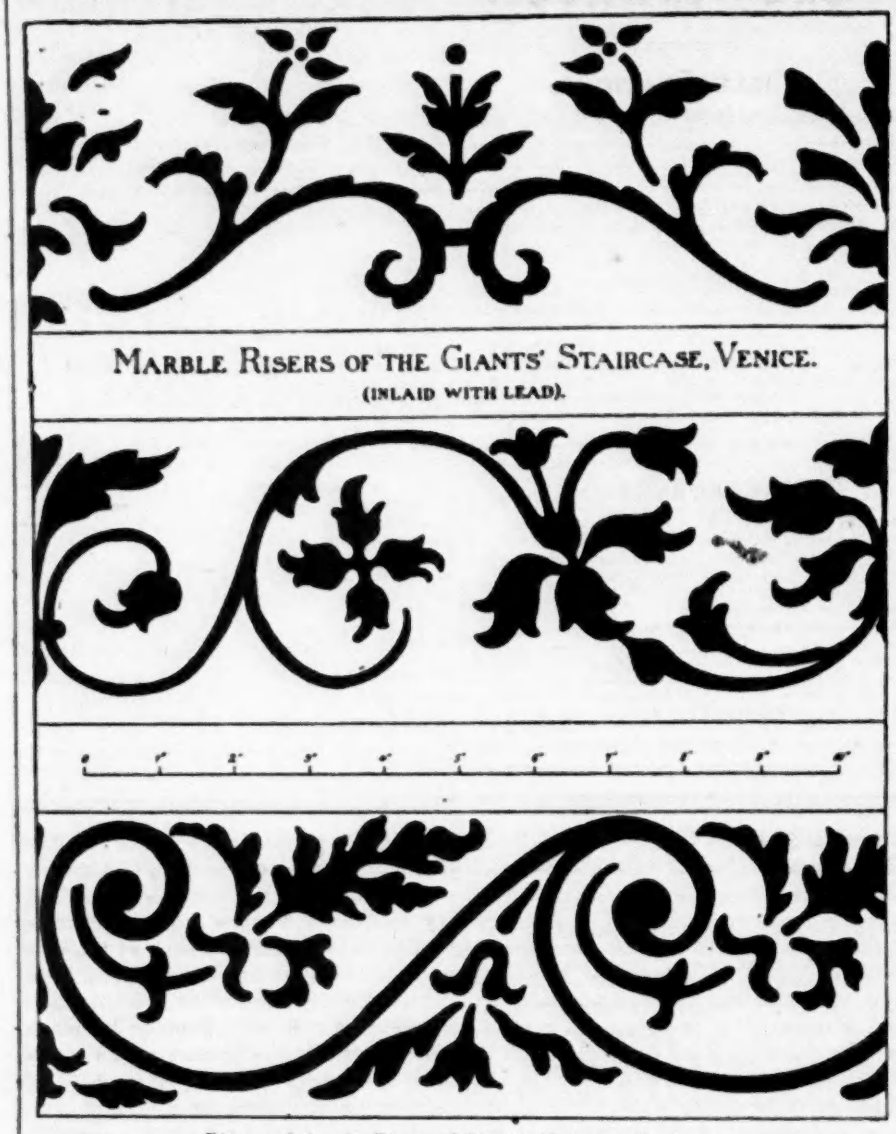

Fig. 1.—Inlay in Risers of Giants' Staircase, Venice.

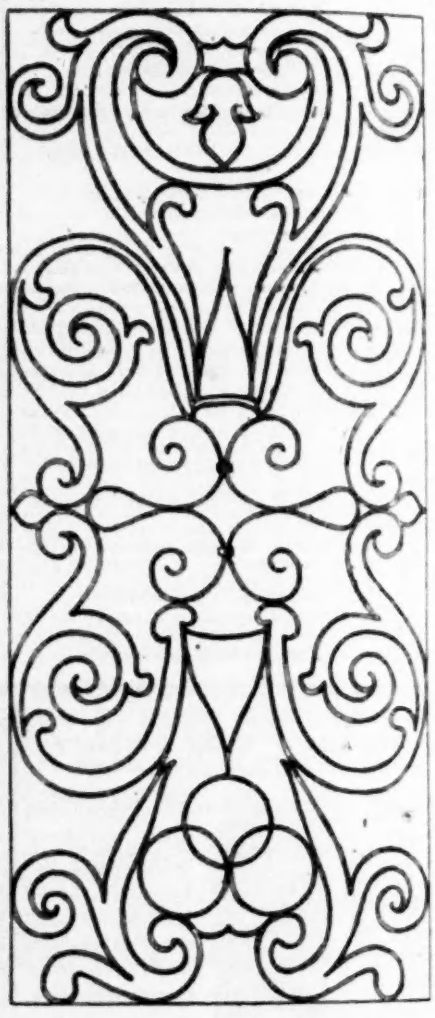

Fig. 2.—Iron Grille over Door, Rome.

plates, can hardly, it is true, be regarded as a novelty; and in some of the other illustrations, if the place and name are not familiar, the design seems so much what one has seen before that we can hardly regard it as a new experience. The "Frieze from a Corner House in Florence" (plate 19) is charming, but is an old enough motive, except perhaps that the foliage scroll is a little more naturalistic than usual. But there are other illustrations which do seem to open new features in Renaissance detail. We do not remember to have seen before, for instance, any illustration of the inlay decoration in the marble risers of the Giants' Staircase at Venice, of which we have given here a reduced copy from the plate (fig. 1). The authors observe also that Italian Renaissance wrought-iron work has been a good deal overlooked, which is perhaps true, though we may observe that Mr. Oakeshott's book contains (on plates 22 to 24) some beautiful examples, superior to any in Messrs. Middleton and Carden's publication. They give, however some examples which are of rather unusual character. There is the gateway in the atrium of San Sisto, Piacenza, with its effective contrast of straight and flowing lines (plate 48); also the grille over this gateway in the following plate; a fanlight from Vicenza (plate 41) rather too formal in design; a very characteristic balcony railing from Via Serena, Padua, with the upper and lower panels formed with oblique lines meeting in scrolls, and a kind of free ribbon border on each side of the straight lines, as if scribbled along them; a curious iron grille in the Calle delle Rasse, Venice; another from the Riccardi Palace, Florence, which, in spite of its being Italian Renaissance, we cannot admire and which we hope will not be imitated; and a very freely-treated and graceful panel over a door in Rome, of which we give a reduced representation (fig. 2).

Among other special features in these illustrations may be mentioned the bands of decorative marble inlay round the bases of the apses in Sta. Maria della Grazie, Milan, four of which are shown in two plates, and which differ a good deal from the most usual types of Renaissance floral design; and a portion of the pavement of Milan Cathedral, printed in colour (the only colour-print in the book); the colours are black, white, and a bright red, the black being used in bands and quatrefoil borders, the red forming a ground for white ornaments of a rather Greek character, while in the centre panels the white forms a ground for red flowers. The design is somewhat mechanical in quality, and if made by a modern artist would hardly pass for more than second-rate; but it affords a suggestion which may be worked out with different detail.

We gather from the results that, in regard to carved ornament, the authors have rather aimed at selecting and illustrating work which is more naturalistic in character than the central type of Renaissance carved design. This gives the illustrations a special interest, as being rather out of the beaten track; but the real glory of Renaissance carved ornament, after all, lies mainly in its conventional leafage; they do not seem to have had the feeling for the best treatment of natural foliage in carving, and something is produced, as in several of these plates, which is a kind of compromise between conventional and naturalistic, and misses the best qualities of both; not being free enough for nature, nor severe enough for convention. It is well to look at ancient examples of this kind dispassionately, and consider how we should regard them if we saw them as modern work. Not all that is old is good or worthy of imitation, even in a great period of art. Among other illustrations that are of special interest and illustrate really fine work are the half of an octagonal well-head in the courtyard of the Doge's Palace—this, we think, has often been drawn or photographed as a whole, but the drawing here shows the detail on a larger scale; the head of a doorway in the Chiesa dei Servi, Padua, where some familiar classic ornaments are treated in an unfamiliar manner; the arch-mould and frieze on plate 43, from Verona; two pilasters from the Certosa at Pavia; and the curious detail of the doorway from the Palazzo de Diamanti Ferrara, with its facetted quoins in the battered plinth and in the jambs; a feature which perhaps has a playful reference to the "Diamanti."

We may thank the authors for giving us a

collection of Italian detail of some novelty, though the collection as a whole cannot be regarded as a typical or central illustration of Renaissance ornament; it rather illustrates exceptional work. The drawings are executed in a rather heavy and coarse style, but they serve their purpose as illustrations. It is a pity that Mr. Middleton's "note" on Renaissance work, which was printed as an advance notice and was sent us with the book, was not bound up with it as a preface, as it contains some good remarks, and there is at present no letter-press at all beyond a mere formal introductory notice. He observes that the study of the mouldings of Renaissance work shows that they were a great deal more free and varied than is sometimes supposed, and that the architects were by no means bound down to the orthodox profiles of the orders. In regard to the iron work, he suggests that the study of it leads to the conclusion that the source of the patterns employed is to be found in the twisted wire ornaments of the goldsmith. This idea is borne out by the kind of design shown in fig. 2, and by some of the others given in the book. Others of them, however, show no trace of such an influence.

THE LONDON WALL AND ITS MORTAR.

FROM time to time remnants of the massive wall with which the Romans, *circa* 360 A.D., encircled the city of London or Augusta are uncovered during the progress of excavations by modern builders. Quite recently a portion of the wall has been unearthed by Mr. J. Terry, the able Clerk of the Works to the Corporation, when excavating for a drain at Old Bailey. The City Surveyor, Mr. A. Murray, under whose supervision the alterations at Old Bailey are being carried out, has kindly given us two specimens of the mortar for analysis, while Mr. Terry has furnished an account of the work discovered, which will be valuable to future historians and archæologists as an authoritative record.

Before proceeding to give Mr. Terry's description the following paragraphs, relating mainly to other portions of the wall uncovered by earlier builders, may be of interest:—

"William Fitz-Stephen writing, in the reign of King Henry II., of the walls of this City hath these words: 'The wall is high and great, well-towered in the north side, with due distances between the towers. On the south side also the City was walled and towered, but the fish-abounding river of Thames, with his ebbing and flowing, have long since subverted them.'" (Strype's *Survey*, 1720).

Dr. Woodward, referring to remains found at Bishopsgate in 1707, writes:—

"The foundation of the wall here lay eight foot below the present surface; and from that up to almost ten foot in height it was compiled of ragstones, with single layers of broad tiles interposed, each layer at two foot distance. To this height the workmanship was after the Roman manner. And these were the remains of the ancient wall, supposed to be that built by Constantine the Great. In this it was very observable that the mortar was (as usual in the Roman works) so very firm and hard, that the stone it self as easily brake and gave way, as that. It was thus far from the foundation upwards, nine foot in thickness."—(Strype's *Survey*.)

Mr. Craik, referring to remains found near the Minories in 1841, says:—

"Behind the south-west corner of America-square the workmen . . . came upon a wall seven feet and a-half thick, running a very little to the west of north; or parallel to the line of the Minories. The principal part of it consisted of five courses of squared stones, regularly laid, with two layers of flat bricks below them and two similar layers above—the latter at least carried all the way through the wall. The mortar, which appeared to be extremely hard, had a few pebbles mixed up with it, and here and there were interstices, or air-cells, as if it had not been spread, but poured in among the stones," &c.

The following is Mr. Terry's description of the present discovery at Old Bailey:—

"The remains recently discovered in the rear of No. 8, Old Bailey, probably formed a portion of the wall of the Roman City of Augusta, in the length that extended in a northerly direction from the river to the first land gate, through which the Watling Street emerged from the City.

This piece of wall, which is 8 ft. high and 8 ft. 3 in. in thickness, was unearthed last March about 6 ft. below the present level of the pavement in the Old Bailey. The construction of the wall, the foundation of which is on the ballast, is as follows:—Commencing at the bottom, there is 3 ft. 6 in. in height of random rubble, composed of large rag stones; then three courses of tiles *sesquipedalis*—viz., 17$\frac{6}{10}$ in. by 11$\frac{6}{10}$ in. by 1$\frac{3}{10}$ in., above which is 2 ft. 7 in. of rag stone of a smaller size; then two courses of tiles, followed by more rubble work. The interior of the wall is composed of rag stone, roughly tumbled in, and then grouted in with lime mortar of an excellent description, the whole forming a hard concrete mass.

The inner face of the wall is in a good state of preservation, but the outer face shows to a marked extent the action of the water of the mediæval ditch."

Two samples of the mortar were taken from the interior of the old wall in Old Bailey, and may reasonably be regarded as genuine specimens of Roman work. One sample was a piece weighing rather more than one pound, the other a piece weighing rather more than half a pound. Both samples contained a number of water-worn pebbles, varying in size up to a maximum of about 2 in. by 1½ in. For analysis the whole of each sample, including pebbles, was crushed to powder, except one small piece which was treated with dilute acid, in order that the uncrushed sample might be examined after the removal of the lime. From the appearance of the sand and pebbles thus separated, it was concluded that *unscreened* river sand was the description of sand employed. The lime and sand had been well mixed, for the mortar was almost entirely free from those small isolated lumps of lime or lime carbonate which are an indication of faulty mixing. Both samples were in excellent condition, and of great strength.

The following results were obtained by analysis, and it will be seen that the two samples were practically identical in composition:—

	No. 1 per cent.		No. 2 per cent.
Water (lost at 212 deg. F.)	1·65	...	1·84
Combined water and organic matter	2·51	...	3·03
Earthy matter, after ignition (Dibdin & Grimwood Test)	4·87	...	4·11
Sand, including pebbles	64·75	...	66·46
Silica, soluble in 10 per cent. HCl	1·00	...	1·57
Oxide of iron do.	0·66	...	0·66
Alumina do.	0·44	...	0·14
Lime do.	15·15	...	13·80
Magnesia do.	0·04	...	0·04
Carbon dioxide	8·46	...	7·95
Sulphur trioxide	0·15	...	0·18
Other matter and loss	0·32	...	0·22
	100·00		100·00
Silica soluble in 10 per cent. soda (Hughes' Test)	8·95	...	10·85
Caustic or slaked lime uncombined	None.	...	None

The "earthy matter" and "sand" in the above analyses were obtained by treating the mortar by the method advocated by Messrs. Dibdin & Grimwood, the chemists to the London County Council, in a paper communicated by them in 1896 to the Society of Public Analysts. The earthy matter and sand, dried at 212 deg. Fahr., thus obtained from sample No. 1, were subsequently analysed, and were found to have the following composition:—

	Earthy Matter per cent.		Sand per cent.
Combined water and organic matter	6·88	...	0·20
Oxide of iron, soluble in concentrated HCl	4·01	...	2·65
Alumina, soluble in concentrated HCl		...	trace
Oxide of iron, as insoluble silicate	1·72	...	0·96
Alumina do.	2·67	...	
Lime do.	0·57	...	0·76
Silica, soluble in 10 per cent. soda	59·11	...	5·00
Silica, crystalline or as insoluble silicate	21·27	...	89·98
Other matter and loss	3·77	...	0·36
	100·00	...	100·00

Before proceeding to calculate the relative proportions of lime and sand employed, it is necessary to consider the composition of the earthy matter and sand. The substances vaguely described as "earthy matter" are substances which, when tested by the Dibdin and Grimwood test, which consists in repeatedly stirring the mortar with dilute hydrochloric acid and decanting off with the solution all insoluble matter which does not fall to the bottom of the containing vessel in one minute, are supposed to be deleterious to the strength of the mortar. The analysis of the earthy matter, however, shows that in the present case more than half the earthy matter consists of silica, soluble in caustic soda, which is a valuable constituent of a mortar instead of an objectionable one. The Dibdin and Grimwood test is an excellent one if the earthy matter obtained be examined before assuming that it is wholly composed of matter injurious to the building quality of the mortar.

Hitherto two mistakes have commonly been made regarding the chemistry of lime mortars. It has been assumed that (1) only that form of silica in lime which is soluble in hydrochloric acid is capable of combining with the lime to form a silicate, and (2) no chemical reaction takes place between the sand and the lime. In Portland cement the whole of the silica is soluble in acid, but good building lime and building sand both contain a certain quantity of silica in a form that is neither crystalline, as quartz sand, nor soluble in hydrochloric acid. This form of silica is soluble in caustic soda solution, and is found in all lime mortars of great strength in comparatively large proportion.

In June, 1892, Mr. John Hughes published in the *Builder* a number of analyses of mortars taken from the various ancient abbeys and castles of the United Kingdom. In this paper he clearly showed the importance of the presence of this silica soluble in soda. [For convenience, this soda-soluble silica will be referred to in this paper as *amorphous* silica, while that soluble in hydrochloric acid will be termed *soluble* silica.] Mr. Hughes, however, wrongly assumes that "it is in this form that most of the silica exists in Portland cement, the actual figures being from 20 to 22 per cent." A glance at the analyses of these Roman mortars will show that there is a difference of

8 or 9 per cent. between the quantity of the two forms of silica. That not only is the *amorphous* silica present in the mortar in a different form to the *soluble* silica, but also is present in much larger proportion. Mr. Hughes also regards the amorphous silica as being present with the lime rather than with the sand, whereas, as a matter of fact, it should be present in both the lime and sand. Quite recently a paper has been published by E. Donath in the *Thonindustrie Zeitung*, which confirms this statement that building sand almost invariably contains more or less of this amorphous silica.

The quantity of carbon dioxide present in the Roman mortars is sufficient to combine with about two-thirds of the lime only; therefore about one-third of the lime must be present in combination, since practically no lime in an uncombined condition remained in the mortar. By deducting the lime required for combination with the carbon dioxide, Mr. Hughes obtained the following striking figures:—

	Constructed Circa.	Amorphous Silica.	Lime as Silicate.
Rochester Castle	1088 A.D.	1·6	1·7
Corfe Castle	1000 „	7·5	1·5

Thus showing that the Corfe Castle mortar, which is referred to as of extraordinary strength, has a large proportion of its amorphous silica uncombined with any base, for neither the iron nor the alumina present amounted to 1 per cent. The Rochester Castle result negatives the theory that in course of time the lime may react upon the crystalline silica.

Reference to the analysis of the "sand" obtained from the Roman mortar will show that 5 per cent. of *amorphous* silica remained with the crystalline sand and crushed pebbles. By Mr. Hughes' test the whole of the chemically active silica—both *soluble* and *amorphous*—is obtained.

The analyses indicate that the proportion by *weight* of the lime to sand used by the Romans in manufacturing the mortar for the London Wall was about one to four. The conversion of parts by *weight* to parts by *volume* is, in a case of this description, more or less a matter of guesswork, but accepting the figures given in Hurst's handbook, showing that one cubic foot of stone lime in lump weighs 55 lbs., and one cubic foot of Thames sand weighs 103 lbs., then the proportion of lime to sand becomes about one to two.

Chemically considered, the mortar is good, because (1) the proportion of lime to sand by volume is about one to two; (2) the proportion of silica soluble in sodium hydrate is high; and (3) the proportion of clay and organic matter present is very small.

There is, however, nothing mysterious about the Roman mortar. Mr. Hughes observed that in all his analyses of ancient mortars "in no case did the proportion of sand to lime exceed in round numbers that of two to one, which is very much less than that found in modern mortars." The Roman mortars in existence at the present day are mostly found in military or government work, which was, no doubt, constructed under strict supervision. Probably jerry-builders were as well known to the Romans as they are to us. Indeed, it may be argued that the jerry-builder is a blessing in disguise, for it is good to know that those monotonous miles of "desirable villas" cannot long endure as specimens of British architecture of the nineteenth century. So far from being more ignorant than the Romans of the art of mortar manufacture, we possess in the fine grade Portland cement of to-day, cementing material of much greater utility than anything they ever knew; and where our lime mortars are inferior to those of the Romans, or of the mediæval builders, the inferiority is not usually the result of ignorance but of what has recently become known as "slimness."

NOTES.

Competition in Building Work.

We should like to draw attention to the remarks at the close of the address by the President of the Architectural Association of Ireland (printed on another page) in reference to the effect on building, and indirectly on architecture, of the system of builders competing for doing work at the lowest prices. More than once we have given expression to our own conviction that it is impossible that the highest class of architecture or the best building can be realised under a system of giving the work to a contractor who has gained the honour of selection by cutting down estimates to the lowest point possible with any profit at all, sometimes to a point inconsistent with any profit except by shirking the proper execution of the work. Under such a system it is impossible that we can ever have such solid and monumental building and detail as that which we admire in, for example, the great houses of the Renaissance period. But Mr. Batchelor, the President of the Association of Ireland, goes further than this; he urges that the competition system is injuring the whole training and perception of the architectural craftsman, from the degeneration of workmanship which has followed in its train. The object is no longer, in fact, to do the best work, but the cheapest. The system has so got hold of all building work in the present day, that people talk and act as if competition tendering and the supplying of quantities to tender on (a builder will hardly condescend to look at a drawing now!) were an integral part of architecture, instead of a mere concomitant of what Mr. Batchelor calls "the real plague spot in our system." He mentions one instance where the clients—the Belfast Banking Company—refused to put a new bank up to competition, and simply commissioned their architect to select the best contractor he could, and arrange a fair price. We have no doubt they got better work than they would otherwise have done. We wish the example were more often followed.

The Housing Problem.

Mr. William Tallack, the secretary of the Howard Association, contributed a temperate and thoughtful letter to the *Times* a few days ago on the Housing Problem. It is the more interesting because it is written by a person who has given careful attention to some aspects of the social question, and stands in an impartial position as regards the matter of housing. Shortly put, the gist of Mr. Tallack's communication is that the County Council should, rather than spend the ratepayers' money in new working-men's dwellings, compel the owners of existing dwellings to keep them in proper condition. There is no doubt that to a great extent the point requires urging on Local Authorities. The existing law is not sufficiently strictly applied. But new dwellings are needed, and there is a clear intention and tendency on the part of the Legislature to give Local Authorities more and more power to become landlords of workmen's dwellings. That being so, the main point is to see that these dwellings do not become a burden on ratepayers generally. But if Mr. Tallack will use his influence to have the present law enforced both in town and country, he will be doing a public service.

An Eight-story Concrete Building.

A concrete office-building, containing seven stories and a cellar, is now being erected in Washington from the designs of Mr. Leon E. Dessery, architect, and, according to an account in *Cement*, possesses numerous interesting features. The building regulations of the city specify that the maximum load on concrete shall not exceed fifteen tons* per square foot, and the walls have been designed to comply with this regulation. The basement wall is of solid concrete about 11 in. thick; above this the walls (with the exception of the front wall) are hollow), having an outer skin 3 in. thick, and an inner skin 5 in. thick for four stories, and 4 in. thick for the three uppermost stories. The inner and outer skins are tied together by vertical "withs" 3 in. thick, spaced from 30 in. to 36 in. apart. The walls are fortified by ¾-in. twisted wrought-iron bars on the Ransome system, two horizontal bars being inserted at the level of each floor, window-sill, and window head, and these are crossed by similar vertical bars running the whole height of the building in the piers between the windows. The front wall is of solid concrete, faced with brick and terra-cotta. The internal partitions, stairs, girders, and floors are also of concrete, with tension rods of Ransome twisted iron. The partitions vary in thickness from 8 in. in the basement to 5 in. in the top story, and the floors are nearly all 6 in. thick. The twisted rods in the floors are 6 in. apart. Shrinkage joints are formed at intervals right across the building. The concrete throughout is composed of one part cement, two parts sand, and three parts blue gneiss, broken to pass a screen with ¾-in. meshes. Such a structure as this would not be permitted in any town in England, as it contravenes the by-laws as to thickness of walls, but it is an interesting and instructive example of what can be done with concrete when the designer is allowed a free hand. Whether our building regulations ought to be modified to allow such erections in this country is another matter.

Bradford Water Supply.

One of the papers read before the British Association at Bradford was prepared by Mr. James Watson, M.Inst.C.E., the Waterworks Engineer of that city, and has now been published under the title of "Water Supply; with a Description of the Bradford Waterworks (Old and New)." The essay on water-supply is too brief to be of much service, and so is the description of the waterworks; but the thirty-six illustrations, reproduced from excellent photographs, suffice to give an admirable idea of the magnitude and variety of the work involved in the construction of the four modern reservoirs. The dam of the Gouthwaite

* The U.S.A. ton of 2,000 lbs. is no doubt referred to.

reservoir is of masonry, with a maximum height (from foundation to highest water-level) of 105 ft. and a thickness of 70 ft. at the base. It is on the same general lines as the well-known Vyrnwy dam, the roadway being carried on fourteen arches above the crest of the dam, and the overflow waters of the reservoir passing under the arches. Two valve-towers are picturesque features of the structure, and Mr. Watson must be congratulated on having given to the work an architectural character of considerable merit.

Saalburg.

MANY besides visitors to Homburg know of the famous Roman fort, as it is called, at Saalburg, on the summit of the Taunus range, looking over the wide valley of the Maine. It was described in the *Builder* on January 23, 1895, and it was there told how the remains of this important military station were gradually being brought to light. Last week the Emperor of Germany laid the foundation-stone of the museum which, it seems, is to be erected at Saalburg itself. We confess that in our opinion the museum would have been better at Homburg, where it could be visited in all seasons and in all weather. Too much restoring has, in fact, been done at Saalburg. It is preferable to have such important remains as this uncovered, and left as time has affected them. To rebuild the walls and to make the fort look as much like the original as possible is to reduce a suggestive and a remarkable ruin to a mere copy. It is much the same as if Melrose or Tintern Abbeys were to be rebuilt in those parts where the old structure has departed. The German Royal Family have for many years shown a great and commendable interest in the Saalburg ruins, but the present Emperor has exhibited *trop de zèle*. The placing of the museum at Saalburg and its rebuilding is all in the same vein as having an actor dressed as a Roman prefect—for such is the newspaper version—to welcome the Emperor and Empress, and then a Roman legate to recite the ode.

The Rowallan Estate, Ayrshire.

THE Rowallan Estate, which covers 6,100 acres, comprising the old castle, dairy farms, woodland and moorland, and yielding a gross rental of 6,350*l.*, will be offered for sale by auction at the upset price of 150,000*l.* on the 24th inst. in Edinburgh. The Castle, or Craig of Rowallan, distant three miles from Kilmarnock, stands upon an eminence by Carmel Water, and presents some striking features in its planning and design that illustrate the change from defensive to domestic architecture in the course of more peaceful and comfortable times. The plan consists of the three sides and (west) curtain-wall of a quadrangle measuring 86 ft. by 72 ft. 6 in., within which the level of the courtyard, which is 53 ft. by 33 ft., is one floor higher than that of the sides as seen from without. The castle is entered from the east by steps which lead up to a round-arched doorway between two circular towers 8 ft. 6 in. in diameter, which rise by four stages divided by string-courses, and have conical roofs capped with finials. The east front is 62 ft. long, but originally extended some 22 ft. further northwards. In the southern block, on either side of the hall, are the dining and withdrawing-rooms; the former apartment is panelled and has an ornamented door, out of it opens a smaller withdrawing-room or boudoir fitted with a wooden screen and wardrobe, both richly carved, and having two stone seats in the east window. A turret stair within a recess of the dining-room—the recess projects into the angle of the courtyard—gives access to the floor above, which contains a room opening into the two drum-towers. The kitchen, well, and vaulted cellars, are in the basement of the southern block. In the court's north-western angle is a gabled building which is now separated from the eastern block—the intervening portion being in ruins—and contains a circular staircase. The dismantled portion, on the north side of the court-yard, seems to be "the new work in the north side of the close," erected by Sir William Muir (*obiit* 1657), author of the "Historie and Descent of the House of Rowallane," and to mark the site of the tower built by Gilchrist Muir, after 1263. To Mungo Muir, who fell on Pinkie Field, 1547, are ascribed, *teste* the "Historie," the basement and hall in the southern block; the east block, with its two towers, was erected by John, son of Mungo Muir, in 1567. Between the towers and above the doorway is a panel carved with the royal arms and supporters, and the coat-arms of Muir; on the frontal, above, is an inscription, with date "1567" between the coat-arms of Muir and Cunningham, for John Muir and his wife, Marian Cunningham. Sir William Muir, *obiit* about 1686, erected the entrance gateway of the courtyard, on which are repeated the date "1661," and a monogram of his own and his wife, Elizabeth Hamilton's, initials. Some further interesting features of the buildings are described and illustrated in Volume II. of Messrs. Macgibbon & Ross's work upon the "Castellated and Domestic Architecture of Scotland."

THE STATISTICS OF SAXON CHURCHES.

BY PROFESSOR BALDWIN BROWN.

IV.—CATALOGUE RAISONNÉ OF EXAMPLES.

THE geographical arrangement of the examples under notice has been indicated on the sketch-map already given (see page 287 *ante*). To have grouped them under counties in alphabetical order would have been convenient but unscientific. In the arrangement adopted contiguous counties are united together so as to form larger districts. It is true that local differences in pre-Conquest work are not very strongly marked; but, in most cases at any rate, the districts do, on the whole, correspond with differences in style of building, though these are not of an absolute character. The districts may be thus enumerated:—I. The South-Eastern counties from Kent to Hampshire. II. The South-Western counties from Wilts and Somerset to Cornwall. III. The Eastern counties, including Norfolk, Suffolk, Essex, and Cambridge. IV. The Midlands, from Notts and Derby in the north to the valley of the Thames. V. The West Midlands from Gloucestershire to Stafford and Cheshire. VI. The district west of the Pennine Chain from the Mersey to the Scottish border. VII. Lincolnshire and Yorkshire; and VIII., the counties of Durham and Northumberland. The general character of each district will, as far as possible, be indicated as a preliminary to a succinct notice of examples. It must be understood that the notices are summary and, only mention points of outstanding importance. Save in one or two cases which will be mentioned when they occur, the information is derived from personal inspection. References are given where a building or a group has formed the subject of an important monograph or paper.

Within each district the examples which have come under the writer's notice ar enumerated in a geographical, not alphabetical order, and the direction in which the particular district is traversed is in each case indicated. Those examples which, when tested by the criteria already passed in review, present a decided pre-Norman character are printed in italics, while in cases that seem doubtful the name is enclosed in brackets. The names of other buildings, which it was necessary to discuss, but which do not maintain their claim to Saxon origin, are printed in ordinary type. The compendious expressions "strip-work" and "mid-wall work" will, no doubt, be allowed; and "l. and s." permitted to stand for "long-and-short work," "r.h." for "round-headed."

DISTRICT I.—KENT, SUSSEX, SURREY, BERKS, HANTS.*

KENT, as that part of Britain in closest touch with the Roman world, and one of the earliest centres of Saxon Christianity, might be expected to exhibit early examples of ecclesiastical architecture with strong traces of Roman influence. A group of such buildings is found at Canterbury and its neighbourhood and makes this one of the most important localities in the whole country. Surrey and Sussex, on the other hand, were in the early days of Christianity comparatively remote and wild, and the Saxon examples, though numerous, are on the whole comparatively late. Building stone is not generally plentiful in the district, and flint rubble is largely used for wall construction. For the same reason l. and s. quoins are very uncommon, especially in Kent, and strip-work does not occur till we pass west of this county. It is not a district remarkable for pre-Conquest towers, though Sompting, Sussex, possesses the most interesting Saxon tower in the country. The most important monuments next to the Canterbury group are Reculver and the church in Dover Castle, Kent; Arlington, Sompting, Worth, in Sussex; Bosham, Boarhunt, and Breamore, Hants. In Kent and Sussex the enumeration is from east to west.

Whitfield, near Dover, is a small, fairly complete, nave-and-chancel church with modern additions. The walls of the nave, of unusual height, are 2 ft., of the chancel 1 ft. 9 in. thick. The latter is little more than 9 ft. square internally. There is a double-splayed r.h. light in the south wall of the nave.

In the same neighbourhood are several early churches, claimed as Saxon by Mr. Loftus Brock and other writers, which do not, however, seem to present those special characteristics which entitle them to a place in the list. They are, or the parts of them in question are, at any rate, of the eleventh century. For example, East Langdon, near Dover, has internally-splayed r.h. windows in the walls of the nave, pierced at a later period by a Norman south arcade. Staple, near Sandwich, has an old window visible in the east wall of the west tower, which is quoted to show that this wall is a relic of an earlier building than the present handsome fabric. St. Margaret-at-Cliffe, near Dover, exhibits remains of earlier masonry at the north-west extremity of the Early Norman chancel. Coldred, in the same neighbourhood, is an interesting early church standing within the lines of a probably Roman fort. The nave-quoins are worked in the flint rubble of the walling, and have been in places repaired with stone showing Norman tooling. This is hardly enough to prove the pre-Conquest date of the fabric.

Dover, St. Mary in the Castle. A spacious cruciform church, with central tower, largely composed of Roman bricks. There are big stone quoins visible in nave transept and chancel, and an interesting blocked south door. There is a plan and description in Canon Puckle's monograph,† but a far too early date is there assigned to the edifice. Its plan is enough to show that it comes comparatively late in the style.

[*Cheriton*] near Folkestone. Here is a slender west tower, the lower part of which may be pre-Conquest, though there is no Saxon cha-

* Among the most valuable papers on the district may be mentioned:—Rev. Greville M. Livett, "Early Norman Churches In and Near the Medway Valley," *Archæologia Cantiana*, xx. 137, xxi. 260; E. P. Loftus Brock, F.S.A., "The Saxon Church at Whitfield, near Dover," *Arch. Cant.*, xxi. 301, and the same writer on "Sussex Churches," *Journal of Archæological Association*, xlii. 35. Since the list for Sussex was drawn up, a paper by Mr. P. M. Johnson, in vol. xliii. of the "Sussex Archæological Collections," has given several other churches in the county that may be of pre-Conquest date.

† "The Church and Fortress of Dover Castle. London. 1864.

[illegible] the quoins. The tower arch, rudely constructed in rubble, 8 ft. 8 in. high by 3 ft. 6 in. wide, with opening above to the church, looks like pre-Conquest work.

St. Oswald, Paddlesworth, on the down above Cheriton, in spite of its dedication, is not to be reckoned pre-Conquest. It is a very interesting and consistently-built Early Norman church. The same must be said about that important example, the present church at Lyminge. This building, constructed of small rag-stones and flint set in abundant mortar, with much herring-bone character, is so like the work of Gundulph at West Malling and Rochester that it is probably of Early Norman date. The quoins and window jambs, &c., are of cut stone with Norman tooling. The walls are 3 ft. to 3 ft. 6 in. thick.

Lyminge (the Apsidal Church). This building, of which the foundations are to be seen south of the present church, dates back to the seventh century (*circa* A.D. 633), and is one of a group that includes the first cathedral at Rochester.

Canterbury Cathedral has been supposed to possess, in some masonry at the west end of the existing crypt, a portion of the pre-Conquest edifice, but there is no valid ground for the ascription, and the same may be said more decidedly of some rubble masonry with herring-bone courses on the west side of the cloister at St. Augustine's, which is certainly Early Norman.

St. Martin, Canterbury, is a monument of the first importance. The pre-Conquest portions consist of the nave and the west part of the chancel. The latter is constructed of Roman bricks, more evenly laid than in any of the examples under notice, except, perhaps, St. Pancras, Canterbury, and Britford, Wilts, and there is some evidence that it once ended apsidally. The former has some red plaster, like Roman, on the walls, and at the west end some newly-discovered windows, r.h. and internally splayed, the arches of which are turned with red mortar, resembling that used in the Roman Pharos at Dover. The masonry of the nave is, however, so mixed and irregular that it is probably of later date than the chancel, which may be Romano-British (Bede, "Eccl. Hist.," i., 26).*

St. Pancras, Canterbury.—Here are the foundations of an aisleless apsidal church, with a porch to the west and what was probably a projecting chapel to the south, constructed of re-used Roman bricks carefully laid with mortar joints averaging 1½ in. in thickness. The mortar contains sea-shells, as does that in the Roman Pharos at Dover. The character of the ground plan makes it doubtful if it is earlier than the seventh century. The nave measured internally about 42 ft. 6 in. by 26 ft. 6 in., but the walls are less than 2 ft. in thickness.

St. Mildred, Canterbury.—The south wall is pre-Conquest, and the big-stone quoins at the east and west extremities of it are among the finest existing examples of the kind. The lowest stone of the south-west quoin is 4 ft. high, 2 ft. 8 in. wide, and 1 ft. 5 in. thick. The north wall, 2 ft. 1 in. thick, is cut through with a later arcade. The west part of the south wall of the chancel is also old. The Saxon church was a large one, the nave measuring internally about 55 ft. 9 in. by 24 ft.

Reculver.—Within the Roman walls of the ancient Regulbium are the ruins of the dismantled church of Reculver, the towers of which are well-known land-marks of the Thames estuary. The west part of the chancel with the foundations of the apse, the nave, and the aisles, are pre-Conquest, and probably date in the seventh century. Whether any part is Romano-British or Roman depends on the view taken of the two fine columns of stone that once stood between nave and chancel, and were discussed in a previous paper.

Stone-by-Faversham.—The west part of the chancel and south-east wall of the nave of this ruined church are so evenly constructed of courses of tufa and Kentish rag alternating with Roman bricks, that it may put in a claim with some other Kentish examples to Romano-British origin (see *ante*, fig. 3).

One or two mid-Kent churches are of doubtful date. One is Westwell, near Ashford, where two small internally splayed circular lights in the west wall are signs which suggest an early origin for that part of the fabric. Kingsdown, near Farningham, has been claimed as Saxon, but bears no sign of such origin. At [*Leeds*] near Maidstone, and [*Shorne*] above Strood, small r.h. lights exist in the walls of the nave above later arcades, and the fact that these openings are double-splayed is strong, though perhaps not conclusive, evidence that the walls are Saxon. The widths of the naves (at Shorne 21 ft.) show that the churches would have been large ones.

Aylesford, near Maidstone, is a fine church on a historic site, but nothing here is pre-Norman. Cliffe-at-Hoo, east of Gravesend, in an outlying region, but well worth the trouble of a pilgrimage, has marks of an old doorway in the north wall that have been pointed to as Saxon.

Rochester (the Saxon Cathedral).—Remains of an early apsidal Saxon church, probably of the beginning of the seventh century, have been disinterred here at the west of the present edifice.

Swanscombe, near Gravesend, has unmistakable signs of pre-Conquest origin in its west tower, and also, perhaps, in the walls of the nave. The tower has some l. and s. feeling in the west quoins, the only example of the technique in the county, and to south a good double-splayed window with the head turned in Roman brick. There are early r.h. internally splayed lights above the south-east arcade. There is Norman work in the chancel, the walls of which are much thicker than those of the nave.

Lydd.—At the opposite extremity of the county near the Sussex border, the north-west corner of the north aisle of this well-known church is now seen to consist of part of the north and west walls of an early basilican oratory. Some of the arches and piers of the north arcade of its nave are visible in the present wall. The span of the arches was about 4 ft., the width of the piers about 3 ft. 4 in. An arched opening about 7 ft. wide can be traced in the west wall, now the end wall of the north aisle of the mediæval church. This, it has been suggested by Mr. Micklethwaite, who was the first to call attention to the remains,* may be the arch of triumph opening into an original west apse. This would furnish an interesting parallel to Silchester, to which perhaps should be added Ripon and the earliest Canterbury. A r.h. opening, evidently double-splayed, and hence not of the earliest type like the windows at Brixworth, exists in the old clerestory. A plan of the remains with details is here subjoined (fig. 11). A little excavation to west might settle the interesting question of the west apse. The other examples where there is evidence of this feature, Silchester, Canterbury, Ripon, are all very early, but the window at Lydd suggests a middle or late Saxon date.

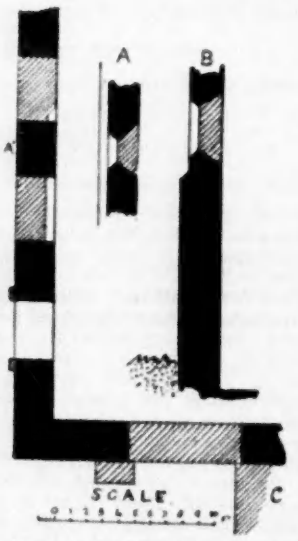

Fig. 11.—Plan of Old Work at Lydd, Kent: N.W. Corner of North Aisle.

A. Plan of Old Window, in North Wall at A'.
B. Section of North Wall at Window. C. Tower.

Sussex.

Bexhill.—The walls of this church above the (partly Norman) nave arcades have been claimed as pre-Conquest, but the distinguishing marks (herring-bone work) point rather to an Early Norman date. The presence here of a fine Saxon carved tombstone is a fact to be taken into account.

Arlington.—The nave exhibits l. and s. work on all four quoins, and there is a small double-splayed r.h. window in south wall with arch turned in Roman brick. The example is an important one.

Friston, by Eastbourne, is a small nave-and-chancel church, probably of the eleventh century, but not necessarily pre-Conquest.

Bishopstone is notable for its fine and well-preserved Saxon porch with sundial. This porch must be the largest Saxon structure of the kind in the country. It has l. and s. in the quoins.

St. John-sub-Castro, Lewes.—A very good Saxon doorway is preserved in the east wall of the north transept of the reconstructed church.

Ovingdean, near Brighton, is an eleventh-century church without any distinct pre-Conquest features, and the same remark applies to Hangleton, near Brighton. At [*Old Shoreham*] part of the nave walls, lengthened in Norman times, are probably Saxon; while at [*St. Botolph*] the chancel arch may be late Saxon, as it bears a certain resemblance to the work at *Sompting*. This latter is a monument of the first importance, and has the only Saxon tower in the country that preserves its ancient finish—a pyramidal helm of the type common in the Rhineland. It is said that the height of the spire was shortened 25 ft. in 1762, but this evidently did not involve any alteration of the masonry of the gables. The tower-arch below has a soffit half-column and enriched capitals and imposts of interesting character (*ante*, fig. 8). Externally the tower has half-round pilaster strips and an enriched horizontal string course. The belfry openings exhibit the mid-wall work not met with in Kent, and the caps of the central shafts are of pronounced corbel form, some of them closely resembling early caps common in parts of Germany.

Bolney.—The most pronounced Saxon feature here is the south doorway of the nave, with reeded archivolt in two orders. Other parts of the fabric are probably contemporary.

Rumboldswyke, by Chichester, is an early nave-and-chancel church, perhaps of the first half of the eleventh century, but with no distinguishing pre-Conquest marks.

West Hampnett.—The chancel is partly Saxon. A r.h. slit internally splayed in its south wall, has inclined jambs. The chancel arch, now destroyed, was of early character.*

Bosham is one of the most complete Saxon churches in the south of England, interesting as being figured in the Bayeux tapestry. There are a Saxon tower and tower arch, early circular windows in the side walls of the nave pierced with later arcades, and a fine moulded chancel arch with angle and soffit shafts, and very interesting Saxon work in the jambs—one of the best specimens of this feature in the country.

[*Singleton*] may be placed in the list in virtue of double-splayed windows in the west tower.

Stopham has good enriched doorways of early character north and south of the nave, and indications of Saxon work in the quoins and walling. Fig. 12.

Woolbeding has a particularly good equipment of pilaster strips, 7 in. wide, which occur on both sides of the nave, and are a clear indication of Saxon origin. The south side of the nave (fig. 13) is indeed one of the best examples of this treatment in the whole country.

Lurgashall has nothing to show but some herring-bone work in the walling.

Worth.—A very valuable and complete example of the Late Saxon period. It is a large church, 94 ft. in internal length, apsidal and cruciform in plan, but without central tower. The chancel arch, 22 ft. high by 14 ft. span, is nobly massive in construction. The nave possesses original double windows with dividing baluster shaft, and narrow north and south doors. Externally there are l. and s. quoins and pilaster strips. The apse is roofed with wood.

Surrey.

The pre-Conquest remains are fragmentary and unimportant. The best example is the (now central) tower of *St. Mary, Guildford*, which exhibits pilaster strips on the four sides, and between them, to north and south, small r.h. double splayed lights.

Godalming has some pre-Conquest indications in the (now central) tower and an old doorway inserted in the wall of the north transept.

* See "The Church of St. Martin, Canterbury," by Canon Routledge. London: 1898.

* *Archæological Journal*, lv.

* *Archæological Journal*, xxiv.

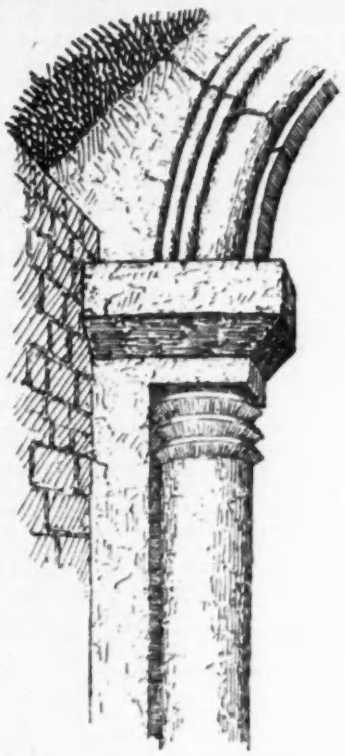

Fig. 12.—South Door of Nave, Stopham, Sussex.

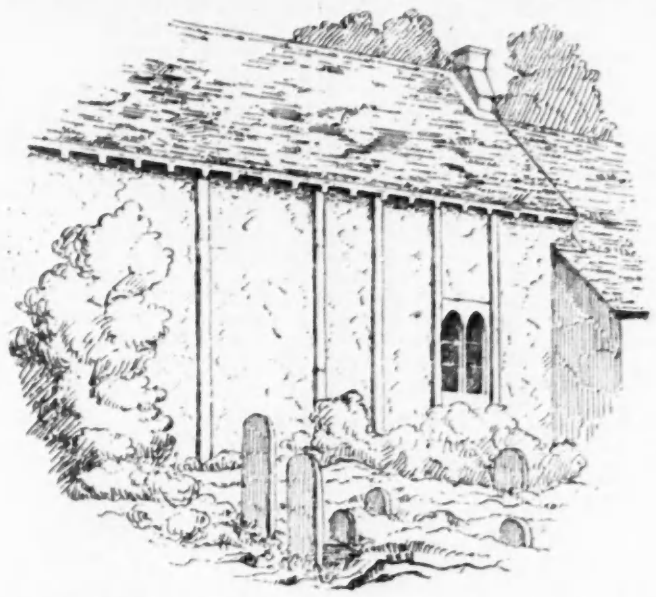

Fig. 13.—Woolbeding, Sussex: South Side, with Saxon Pilaster-Strips.

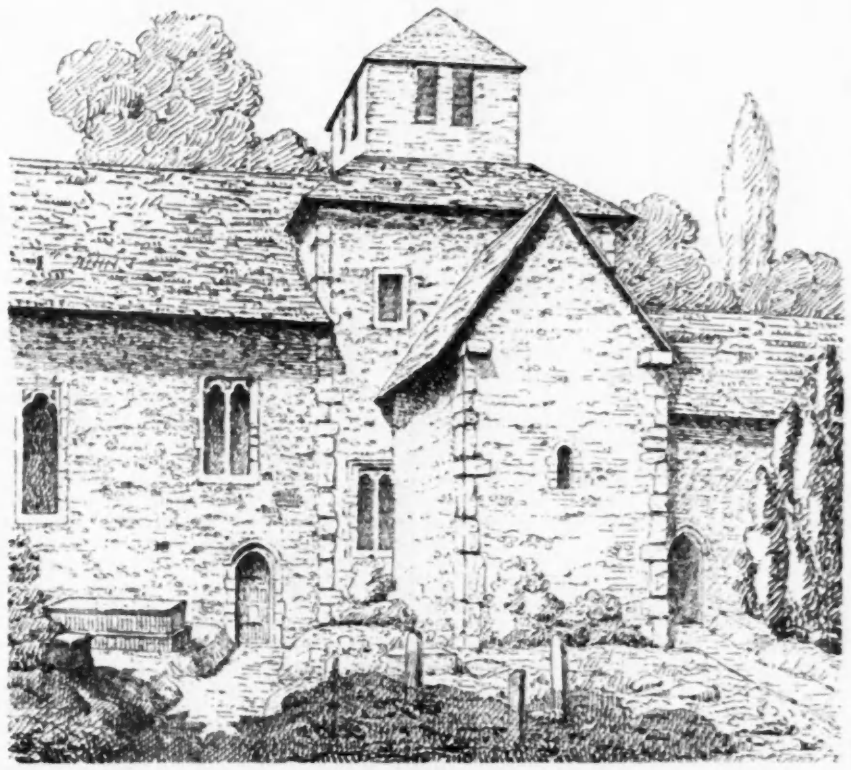

Fig. 14.—Breamore, Hants: View from South.

Fig. 15.—Arch into South Transept, Breamore, Hants; with Old English Inscription.

Of the other Surrey churches claimed as Saxon, Chipstead and Fetcham have early r.h. internally splayed windows in walls broken through by later arcades, and Wotton an early, but not necessarily Saxon, tower arch, *Stoke d'Abernon* some old walling on the south side, with a Saxon sundial apparently *in situ*, and Abinger, an Early Norman nave with well-preserved narrow r.h. windows on both sides. Finally, Albury is a partly-ruined building of the most picturesque beauty. A church here is mentioned in Domesday, but there is nothing of earlier date than Norman to be seen in the present fabric.

BERKSHIRE.

Our examples are confined to Cholsey, a building we have seen reason to regard as Norman, in spite of the l. and s. work in the tower quoins, and *Wickham*, near Newbury.

Wickham possesses one of the square west towers characteristic of Lincolnshire and the North, but rare in the southern counties. It has l. and s. quoins, double splayed r.h. lights, and on the old belfry stage double openings north and south with mid-wall work, the through-stones being supported on Roman shafts, figured in the *Builder*, December 13, 1898.

HAMPSHIRE.

We find at *Boarhunt*,* in the country north from Fareham, a complete nave-and-chancel church of Late Saxon date. The nave was originally divided by a partition wall towards the west end. An excellent double-splayed Saxon window opens north of chancel, with double cable ornament carved round the exterior opening in the mid-wall slab. A pilaster strip runs up the east gable.

Corhampton.—A nave-and-chancel church, with the east end altered. Saxon character is attested by external pilaster strips, 6 in. wide, and a characteristic blocked north door to nave, by l. and s. in quoins, and a Saxon chancel arch with strip work. There is also a Saxon sundial and, perhaps, font.

Hinton Ampner has been rebuilt, but some of the old Saxon features survive in the form of l. and s. work in quoins, and pilaster strips.

[*Tichborne*] exhibits the puzzling combination of double-splayed windows in the north and south walls of the chancel, with clasping corner buttresses of Norman fashion and wide pilaster strips (13½ in.).

Headbourne Worthy.—Pilaster strips show that at least the south wall of the chancel and north wall of the nave (l. and s. at north-east quoin) are pre-Conquest, while the west door of the nave, measuring 3 ft. by 7 ft. 6 in., is of characteristic Saxon work, and has above it, cut back flush with the wall, the remains of a carved stone crucifix with figures of Mary and John at the sides. There is a west adjunct of the fifteenth century which it is interesting to compare with the similar feature of Saxon date in the church of Barton-on-Humber.

Little Sombourne.—This small and dilapidated church consists now only of a nave, on the north-west quoin of which there is l. and s. work. A pilaster strip occurs on the north wall.

Warnford. The name of Wilfrid is by tradition (attested by an inscription) connected with this place, but the interesting church and the ruins hard by present no Saxon indications

* See paper by J. T. Irvine in *Journal of Archæological Association*, xxxiii.

Silchester.—If the small building south-east of the Forum of the Roman city, of which the foundations were laid bare a few years ago, is really an early Christian Basilica, it is of extreme interest as the only certain relic in the form of a building of Romano-British Christianity. It is basilican in plan with narthex and apse, the latter at the west end, a peculiarity suggestive of an early date. It may be ascribed to the third or fourth century A.D.*

Breamore.—This church, only recently recognised as Saxon, is one of the largest and most complete pre-Conquest buildings in the country. It consists of nave with indications of some west adjunct, chancel, south transept, and south porch which is a later addition. The fabric is of flint rubble with l. and s. ashlar quoins and pilaster strips. The old windows are r.h. and double-splayed. There is the beginning of a central tower, and the monument is of great interest in connexion with the development of this feature and of the cruciform plan.

It will be observed in the view in fig. 14 that the tower is distinctly a growth from the nave wall, not, as in some other cruciform Saxon churches (Stow; and Norton, Durham), an independent structure from the ground upwards. It is not, however, merely a part of the nave wall heightened, as at Dover Castle, but is distinctly prepared for by a thickening of the walls of the nave and by courses of l. and s. work embedded in and flush with the face of the walls. As soon as the height of the nave roof is reached these courses become regular quoins and the tower proclaims itself as a distinct feature. The transept is in process of development out of the side-chapel, or, as the Early Mediæval writers call it, *porticus*. The arch into this transept has over it a Saxon inscription, which on linguistic grounds has been pronounced to be not much earlier than the middle of the eleventh century. The words (fig. 15) are explained to mean, "Here the covenant becomes manifest to thee," and may refer to the fulfilment of some vow. If the vow was for the building of the church it would fix the date of this somewhere about 1050.†

District II.—The South-Western Counties. Wilts, Dorset, Somerset, Devon, Cornwall.

In this district Wilts furnishes us with two very important examples at Britford near Salisbury, and Bradford-on-Avon, and with several others of less outstanding value. The list from the other counties is extremely meagre, and no doubt might be supplemented.

Wilts.

It is no great distance from the example last noticed to *Britford* by Salisbury, where we find a mediæval church of cruciform plan, with no external marks of great antiquity, possessing in the nave three arched openings of a very curious character. One of these encloses the present south door, while the other two face each other north and south at the east end of the nave. In comparison with the width of the nave, more than 20 ft., they are very small, about 5 ft. 8 in. in span by 8 ft. in height and, as they are elaborately enriched on the jambs and have no rebates for doors, they must have opened into side chapels of some kind or embryo transepts. Roman brick is employed with neatness and skill in their construction; in that to south the jamb is mortised into the impost in Roman fashion (*ante*, fig. 4), and in that to north the jambs are enriched with carved stone slabs exhibiting both knot-work and conventional vine foliage. A little excavation on the north side, where there are no interments, might solve the question of the original intention of the openings.

North Burcombe.—All that is left here is l. and s. in the two east quoins of the chancel.

[*Netheravon.*]—The square west tower is all we are concerned with here. This has a west portal and a tower arch (with angle shafts) that in themselves would date the tower in Early Norman times. Mr. Micklethwaite, however, finds in it traces of arrangements characteristic of pre-Conquest days. According to the editor of the Domesday for Wilts, the Survey reports at this place a church in a very dilapidated condition—"*vasta est et ita discooperta ut pæne corruat*"—and it will probably be best to regard the tower as due to a rebuilding after Domesday date. The case is, however, a doubtful one.

Avebury.—A well-identified Saxon nave still retains some of its original windows in two tiers, *i.e.*, r. h. lower windows with inclined jambs, and circular upper lights; l. and s. at the north-west quoin. The walls are high and thin.

Bremhill, near Calne. L. and s. on exterior quoins of nave.

Broad Hinton, near Swindon, only exhibits a small r. h. light in north wall, but *Somerford Keynes*, near Cricklade, has retained one mark of great antiquity in a very characteristic Saxon enriched north doorway to the nave. Tall and very narrow (8 ft. 4 in. by 2 ft. 6 in.), it is one of the best specimens of its kind to be seen (fig. 16).

Fig. 16.—North Door of Nave, Somerford Keynes, Wilts.

Bradford-on-Avon.—A very small, well-constructed stone nave-and-chancel oratory, with a north porch possibly once balanced by a porch on south, has been rescued here from a subdivided and desecrated condition, and, much restored, presents now a very attractive spectacle. There is strong, though perhaps not conclusive, external evidence that it is the building spoken of by William of Malmesbury as an *ecclesiola* erected by St. Aldhelm about the year 800. The good stonework is native in the district and would agree with an early date; the proportions of the building, with nave walls 25 ft. high on a width of about 13 ft., and of its openings—the chancel arch is only 3 ft. 4 in. wide—are early, and the enrichment shows classical reminiscence. On the other hand, the shallow arcading cut in the stonework on the exterior bears a remarkable resemblance to a similar feature in the interior of the Late Saxon church of Dunham Magna in Norfolk, and throws a doubt on the early date. Sir J. Parker, it is true, made the suggestion that the arcading might have been added at a later date. The old window in the chancel is double-splayed.

In leaving Wiltshire it must be noted that the apsidal church of Manningford Bruce is clearly of Norman, not Saxon date.

Dorset

furnishes us at *Wareham* with a well-preserved Saxon church, dedicated to St. Martin, but not so old as this ascription might seem to suggest. It has various marks of pre-Conquest date, including l. and s. quoins and remarkable height and thinness of walls. The chancel arch has soffit shafts.*

Sherborne Minster has scanty remains of a Late Saxon doorway that in this position has special interest as part of a Saxon church that once held cathedral rank. The Minster presents the same combination of Perpendicular architecture superinduced on Norman as Winchester Cathedral, and the only pre-Norman part is to be found at the exterior of the western wall of the present north aisle. Here is a built-up doorway of undoubtedly Saxon character, with a little of the contemporary masonry to the south of it. It had l. and s. work in the jambs and chamfered imposts, and there was strip work in the form of a half-round moulding encircling it. It was 3 ft. 9 in. wide, and seems to have formed the west door of the Saxon bishop's church. It should be noticed that its architectural character denotes a date far later than that of St. Aldhelm.

No other examples in Dorset have come under the writer's observation.

Somerset.

The two that are noted—Milborne Port and Cranmore—do not seem to carry a pre-Conquest stamp.

Devon and Cornwall.

Here the only example which the writer has seen is the recently-discovered early crypt under the twelfth-century Norman chancel of *Sidbury* Church, in the former county. The special interest of this small chamber is the fact that it presents yet another plan of crypt later in type than even Repton. It was directly accessible by open steps from the nave like the crypts at San Zeno, Verona, and San Miniato, Florence. Part of the jambs of the doorway to the crypt at the bottom of these steps remains, and the masonry of that to the north is of Saxon character. This is not very pronounced, and the stones show diagonal tooling, but that, as we have seen, does not preclude a pre-Norman date. The jambs look, at any rate, more like Saxon than Norman work. The dearth of Saxon churches in this region is all the more striking when we turn back from the west to the east of England, and begin to traverse the country again from east to west upon a more northerly line. The first of these districts is one of particular richness.

In answer to an inquiry, the following note may be added on the thickness of wall in the churches the comparative sizes of which were indicated in fig. 2, p. 288, *ante*. (The dimensions there given, it should be explained, are of the naves only, and are internal ones). Whitfield; Wareham; St. Martin, Canterbury (north and south walls); St. Pancras, Canterbury; and Monkwearmouth, have walls about 2 ft. thick. Coln Rogers is 2 ft. 3 in.; Escomb, 2 ft. 4 in.; Deerhurst Chapel, Bassingham, Bracebridge, Avebury, Ropsley, and Rochester, are about 2 ft. 6 in.; Greens Norton, 2 ft. 8 in.; Kirk Hammerton, nearly 3 ft.; and Rockland, 3 ft. 5 in.

COMPETITIONS.*

(Continued from page 318.)

It appears to me that in certain cases something almost approaching an infatuation takes hold upon some architects who compete for public work. I have known instances of men who were so entirely unable to believe that the design they had made was not really the best, that they have for the time lost all self-control and have said unjustifiable things; and I regret to add that I have known other cases where men who did not come out top have intrigued and schemed, with the object of displacing the architect who has won the competition and substituting themselves. Nothing can be more reprehensible and unprofessional than this attempt to play the part of the cuckoo. As to the man who finds himself too much wrapped up in his design to be able to accept defeat with dignity, I think the best thing would be to refrain from architectural competitions for the future.

One word as to the successful competitor. He occupies a pleasant position, because the design of the future building is in the main settled, and because, at a stroke, he has gained the confidence of a set of clients. Both these advantages can, however, easily be lost. He should strive to retain them. It is wise, if the architect be asked to modify his design, to do so with reluctance and not readily. It is quite possible that efforts may be made to put the execution of the design into other hands; but the successful competitor always has it in his favour that he is the author of the design; and generally speaking, the majority of any committee or board of Englishmen has a strong

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* Figured and discussed in *Archæologia*, liii. p. 563.
† For an account of the church see *Archæological Journal*, lv.

* "The Church of St. Martin, Wareham, Dorset." By Charles Lynam, F.S.A. *Builder*, March 12, 1898.

* Address delivered to architectural students at University College, October 8, by Professor Roger Smith.

sense of fair play, and will, by instinct, support him.

If the successful competitor be commissioned to erect his building, it is to be hoped that he will not allow himself to be so puffed up as to be above learning the endless minutiæ of his calling as they affect the building in question. I write these words in a seaside hotel which has every appearance of having been a successful competitive design, and which is really handsome and well-grouped externally, and parts of which are fairly well arranged; yet it is full of faults in the practical adaptation of the building to its purpose—*e.g.*, the kitchen is remote from the rooms where the food is consumed. There is a most convenient external balcony, but the windows giving access to it are sash windows, and so heavy, that it takes a strong man to lift them, and when they are at the widest the shortest person has to stoop to get out. There is no lift. The staircase has only a handrail on one side, and is of wood and enclosed by wooden panelling so that in case of fire it would be of little avail. The windows of some of the bedrooms have their sills so high up that it is impossible to see out. Those of others are at the floor level and can hardly be opened without kneeling down, and so on with other blemishes.

The risk of failure in these matters of detail is very considerable. Should any one of you find himself early in his career appointed architect to a building which he has won in competition, let him assure himself that there are many points in the working of such a building that he has yet to learn, and let him set himself indefatigably to learn them in some other way than by making mistakes at his clients' expense. Far better get a thoroughly experienced honest clerk of works and not be too proud to learn practical details from him.

I propose now to turn for a moment to another side of the question and to ask you to look at the assessor and his work. You may, some of you, become assessors yourselves by-and-by, and, on the other hand, if you are competitors you are likely enough to entertain a feeling of hostility to the whole race of them, which, perhaps, will be lessened if you consider what they have to do.

In a few cases the assessor is called in from the beginning, and has the duty—often a most troublesome one—of stating the requirements. I will not trouble you with any remarks upon this part of his duty, except to say a word upon the question of cost. The paper of suggestions issued by the Institute says that it is part of his duty "to advise upon the question of cost." I cannot avoid expressing regret that this memorandum does not put more strongly his duty in this respect. I take it that if a limit of cost is stated he is bound to satisfy himself that such limit is fully sufficient; or, if that cannot be done, then to stipulate that such limit be stated only as the amount which the promoters do not wish to exceed—or in some similar way left elastic. The mistake commonly made by promoters who have not called in the assessor at this stage is to fix the requirements and the cost, and to do this on such a scale that the money will not suffice to pay for the necessary building. The assessor, therefore, ought to be perfectly certain that the money is sufficient. Failing that, if the accommodation is rigidly fixed the money should be left, as I suggest above, elastic; otherwise, if the money must be definitely limited then the accommodation must be left elastic.

We will now suppose our assessor about to begin work on a series of designs. If he is wise he will have stipulated that he is to have them entirely to himself and not to be expected to advise the committee or consult with them till he has made up his own mind. This stipulation will be felt to be reasonable and will be agreed to.

He will also have stipulated that the drawings be hung up or set out in some roomy place so that he may readily get access to them, and these preliminaries being settled may set to work. Probably various men work upon varying lines. I can only describe to you the methods of one architect who has filled the office a good many times.

We will suppose the most common case—namely, one where the designs have been invited by public advertisement and a good many have been received.

It is good first to take stock of the whole series, which we may suppose to be twenty or thirty in number, and if there is a list of them, to check it, but whether there is or not to walk slowly through the series, note-book in hand, and note the motto and number of drawings in each in turn; giving, perhaps, one page or two pages of the book to each design with a view to subsequent memoranda.

The first entry might probably run thus:—"Experience" seven strainers, brown mounts, no perspective; report; estimate," and so for the whole. By the time this has been done the assessor has something of an idea of what he has to deal with. He must next take the designs one by one, beginning by preference at one which has obviously been prepared with care and must go through all the conditions and instructions, step by step, and see how they have been carried out. He will soon begin to feel that he has more or less filled his mind with the requirements and knows the nature of the problem both in relation to the planning and the architectural treatment of each individual design. It may not be necessary to examine every design in the same detail.

Our assessor will in time have completed a critical first inspection of the designs. If he has been the author of the instructions to architects, that circumstance will help him, as the requirements must be fairly present to his mind.

It is convenient in examining a series of designs to have a few leading heads, and to employ a system of marks. A low number of marks, say four or six, for each head will suffice. The first head should, of course, be:—

1. Conformity to instructions.

Then may follow:—

2. Planning of individual parts, rooms, wards, or sections.
3. Planning of internal communications and staircases, and of the approaches.
4. Lighting and ventilating.
5. Exterior elevations and grouping.
6. Sections and interior architecture.
7. Special points (if any), such as decorations, details, indications of care in preparation of design, draughtsmanship.
8. Economy and sufficiency of estimate.

Should any design unquestionably fail in its conformity to the instructions it must be thrown out, but the failure must be unquestionable and unmistakable to justify this. For instance, I remember many years ago in a competition for a church to seat 500, the best and most compact design turned out only to provide 450 sittings. Of course, there was an end of that design, but I do not think it would have been right to turn it out if its sitting had come to 495 instead of 500.

One of the perplexities of an assessor is the case which often occurs when a design *partly* fails to conform. It is best not at this stage to throw it out, but to mark it under the head of "conformity" with less than full marks. In all probability it will relieve the assessor of anxiety by proving itself inferior in other respects as well as in conformity to instructions.

If the points I have enumerated be taken one after another and marks corresponding to the merit of each design in respect of provision made for each one be carefully awarded, the marks will form a very fair approximate guide, though not a final guide, to the relative excellence of the designs.

At this stage it may not be necessary to look into the estimate of each competitor, but it will be of importance to determine how far each design is expensive or economical, lavish or careful in character, and to award marks under the last head, that of economy, accordingly. The more troublesome business of examining and checking estimates will come on a little later.

An assessor's duty is by no means always easy. It is especially difficult if he finds himself called upon to apply a set of instructions to competitors which cannot possibly be carried out perfectly. This, if it occurs, places him, as it must already have placed the competitors, in a position of no small difficulty and in which he has to do the best he can to be fair to them.

When he has completed the first round our assessor will find that some designs have not gained half marks, some two-thirds, and so on. He is probably justified in at once striking out all that have not got half-marks, but it is wise in doing so to enter in his book some one or more points in which each design so removed fails. Such an entry as the following, for example, may be made:—"Spes," "only thirteen marks out of twenty-eight; defective approaches, much space lost in corridors, part of interior badly lighted, exterior deficient in grouping and tame when compared with several other designs, not economical, fails." If the committee ask the assessor why "Spes" did not seem to him worthy of a premium, he has in this way, the material for a reply ready.

The designs having been once reduced in number, those left must be gone over critically a second time, and perhaps a third or a fourth time; each time throwing out the weakest of those left. Each of these reductions will be more troublesome and difficult than the last, because what are left are the better designs. Sooner or later the assessor will probably have reduced his total to a manageable number, say from half-a-dozen to half-a-score, and will be sure that the one he will at last select is among these. It is now time carefully to read the reports of the authors of these designs, and then to examine the estimates.

In many cases the cubing is asked for in instructions. If it is given it is quite right for the assessor to check it, for one man's idea of cubing is to take his heights from the ground-floor line to the wall plate, while another, who is more candid, takes them from the bottom of the footings to half way up the roof, and then adds for turrets and chimneys. The result of a comparison of the cube contents with the stipulated sum will probably strike out two or three of the remaining designs—perhaps more. Possibly the finest as architecture will be among these; certainly the most liberal are likely to be so. It is, however, only fair to those architects who have loyally and bravely struggled with the difficulty which is presented by the estimate question that they should not see men who have disregarded this condition preferred before them. No feature of the work of an assessor is so difficult and trying as this, for he as often as not will feel obliged to set aside the drawings with which, as an architect, he has the most sympathy, and which would turn out the finest architecture, and to fall back on something far more moderate and modest. The assessor is fortunate who has to deal with a set of conditions which do not rigidly prescribe a limit of cost.

It is not infrequently the case that to keep within the limit of cost is impossible. Under such circumstances, the suggestions of the Royal Institute direct that "the assessor or assessors shall not be bound in the selection of a design by the amount named in the instructions, but the question of cost shall nevertheless be a material element in the consideration of the award." This is, no doubt, the fairest course to pursue when dealing with a serious difficulty.

This work has almost all to be done personally. It is an undertaking in which assistance is of little help. Of course, a competent assistant can check the cube estimates of designs requiring to be so checked, and he can do something in the way of examining critically whether instructions have been minutely carried out or not; but beyond this I doubt if there is any advantage to be obtained by employing assistance.

At length, after reconsideration and a balancing of conflicting claims, it is, I believe, always possible to arrive at a decision that a certain design is the best and that some other is the next best.

My advice would be either to report verbally or to prepare a short report in writing stating what the assessor's selection is, and to give an account of the good points of what is selected, and then to stop. It is wise not to say a good word for any other design submitted, though you may feel inclined to do so. It is even more prudent not to say a bad word, either about any design not selected or about any part of either of the premiated designs. Silence is golden. The assessor will probably have a meeting with his committee, and it may be his duty to give *viva voce* the reasons for no premiating or praising this, that, or the other design. This his notes will enable him to do, but a written report is apt to get into print, and either praise or blame of a design, successful or not, may very possibly do harm.

I am bound to add that this office of assessor is a very anxious and responsible one. He who fills it has to be careful to do no injustice to the members of his own profession who have competed. He is equally bound to do justice to the employers who call him in and pay him, and who rely upon his honesty and skill to guide them.

I have nothing to say about the unfortunate but possible case that the committee may fail to agree with the opinion of their assessor and

may award the premiums differently to his report. I have no experience of such a situation, either in my own experience or in that of my professional friends, and I am of opinion that it very rarely occurs.

There is, however, another unfortunate result which must from time to time be reached when the upshot of the competition is to convince everybody, including the promoters or their assessor, or both, that a radical mistake had been made at the outset; that something different from what was described in the instructions really meets the case best; and perhaps that some competitor, who had deviated from the instructions, had divined the real wants of the employers, and designed something to meet them better than the successful design. This is a perplexing situation, and I can only say that it is exceptional, and that if it occurs it must be dealt with on its own merits. Usually the fairest course and the one which in the majority of cases promises to lead to the best results will no doubt be to assume that the competition has settled the question of the choice of an architect, and to proceed to settle with the aid of the successful competitor what had best be done. Sometimes there are, unfortunately, good reasons against this course. Occasionally a second competition among the architects who had distinguished themselves in the first has been resorted to. At others the premiums have been paid and the whole matter dropped.

It must be remembered that a committee, as a rule, promises nothing more in its advertisement than to pay the premiums, and that when it has done this it has discharged its legal obligations, and may proceed to do things which are harsh or even unjust without being easily amenable to remonstrance.

The whole procedure is more or less modified in the case of a limited competition; *i.e.*, one when designs are invited from a small number of architects known to those who promote the competition. This has become a very usual course, and in the interests of those who have large undertakings in hand it may often be more prudent than inviting all the world, but it does not open to us the same chances of distinction. It is often usual in such a case to pay something to each competitor towards the expense of preparing his designs, and to offer the position of the architect of the intended building as the one prize. This course has been lately adopted in several competitions where important and costly buildings were contemplated.

I ought not to pass unnoticed the complaints, far more common formerly than now, that undue and underhand influence led to the decision of most competitions. I believe that formerly there was a good deal of nepotism in such matters, and that the customary employment of a professional assessor has done a great deal to put a stop to it. I do not fancy that the general tone of morals has altered for the better, but I do believe that it has become much more difficult than once it was for an intriguing or an overbearing member of a building committee to secure that the first premium shall go to his nephew or to the son of a good customer.

It may be a little interesting to refer to a few famous competitions and their upshot. There was one in the fifteenth century which, though it was a competition among sculptors, indirectly affected the whole course of Renaissance architecture. I refer to the one for the gates of the baptistry at Florence. The early Italian artists, many of them, practised more arts than one, and among the competitors was Brunelleschi. Happily he failed—happily on more accounts than one, for the prize was given to Ghiberti, who executed a noble work, and followed it by the great pair of gates, which are an unrivalled work of their kind and occupied the best years of his life. Meanwhile Brunelleschi, who might have given himself up to sculpture had he gained this competition, devoted his life to architecture, and is rightly regarded as the father of Italian Renaissance architecture.

The most important competition of the nineteenth century was, no doubt, that for the rebuilding of the Houses of Parliament, held in the year 1835. It was an open competition—that is to say, designs were invited by public advertisement. A large number were received, and fortunately the ultimate result was that the most important building erected in Great Britain during the century was put into the hands of unquestionably the greatest English architect of the century, Sir Charles Barry. But during the many years which the structure took to complete, there were so many disputes and complaints and so much wrangling, that the general position of architects as a profession was seriously compromised. The unfortunate choice of a scientist who did not know his own mind, to arrange for the ventilation of the building, added to the difficulties and did much to discredit the cause of scientific ventilation and, indirectly, of sanitation. The building is erected generally on the lines of the competition ground-plan, but the exterior was entirely redesigned in the course of its execution, and is incomparably finer than as originally proposed.

Perhaps the most unusual incident in connexion with the competitions of the century was the success of William Burges (I think in co-operation with Mr. Clutton) in the competition for the Roman Catholic Cathedral at Lille, in France. Burges was a perfect master of French Gothic and made a superb design, but he was so convinced that nothing which was known to come from England would have any chance of success, that he wrote and printed to his design in French—and in French handwriting—and dimensioned it in metres, and then took the drawings across to a town in France, from whence they were forwarded to Lille; every indication of English origin, like labels or marks being most carefully removed. The designs gained the first premium, but it was a barren success, as Mr. Burges was not employed to erect the Cathedral. Sir Gilbert Scott was more fortunate, as he gained a competition for a great public building in Hamburgh and built it. He was in his earlier days a very keen and constant competitor, and to the close of his life enjoyed with the utmost zest in limited competitions for important work, such as the Law Courts and the Albert Memorial. The first of these he did not gain, the second he did.

The competition for the Law Courts was one of the most considerable of the latter part of the century. It took place among invited architects only. Each man was paid a very handsome sum for the preparation of his design, and the drawings were publicly exhibited before the decision. The judges originally recommended that Mr. Street and Mr. E. M. Barry should be appointed joint architects, but the Government referred the recommendation back to them and required that only one architect should be named, with the result that Mr. Street was appointed, and erected the building. It is probably the last secular monument in London of the great Gothic revival, as the Palace of Westminster was the first. It has the indications of a true artist's work all over it, but not an artist of the calibre of Sir Charles Barry, and it has very great practical defects, which probably an architect with a larger experience of public buildings would have known how to avoid.

Success in competitions has contributed to found the practice of many of the more prominent architects of the present day; but I do not propose to discuss with you the competitive works of living architects. They would range from Mr. Waterhouse's Manchester Law Courts, won probably forty years ago or thereabouts, to Mr. Mountford's recent success in the competition for rebuilding Newgate. Open competition has not been the way in which many of the important works of the leaders of our profession have been of late years won. In many cases limited competitions have been resorted to, while recently the Government has shown a disposition to do what private clients mostly do, and place a public building directly in the hands of a single architect, nominated on account of his known ability. The new Government office in Whitehall should in time show how far this succeeds, but I confess that I should expect a man of ability to do better for a great work so put into his hands than for even the most important one gained in competition. Of course, it is partly a matter of personal temperament. One man works best under the stimulus of a struggle; another finds the responsibility of a great undertaking, looking to him from its inception to mould and form it, as calling out his highest powers in the best way.

Let me in conclusion remind you, gentlemen, that especially in a crowded community like ours all professional life is a life of competition. There are a number of buildings in the future the erection of many of which will be entrusted to architects of the standing of your own selves. Why not to some of you? In the struggle for existence which Mr. Darwin has shown us as going on among all animals and all plants, and which equally goes on among architects, no property, no quality, no peculiarity which can be of advantage to the animal, or the plant, or the architect but helps its possessor. It is emphatically so with our own profession. There is nothing which you can learn, in this college or elsewhere, bearing upon your profession that will not help to render you more fit for the exercise of it, and remember, gentlemen, that success in life means "*the survival of the fittest.*"

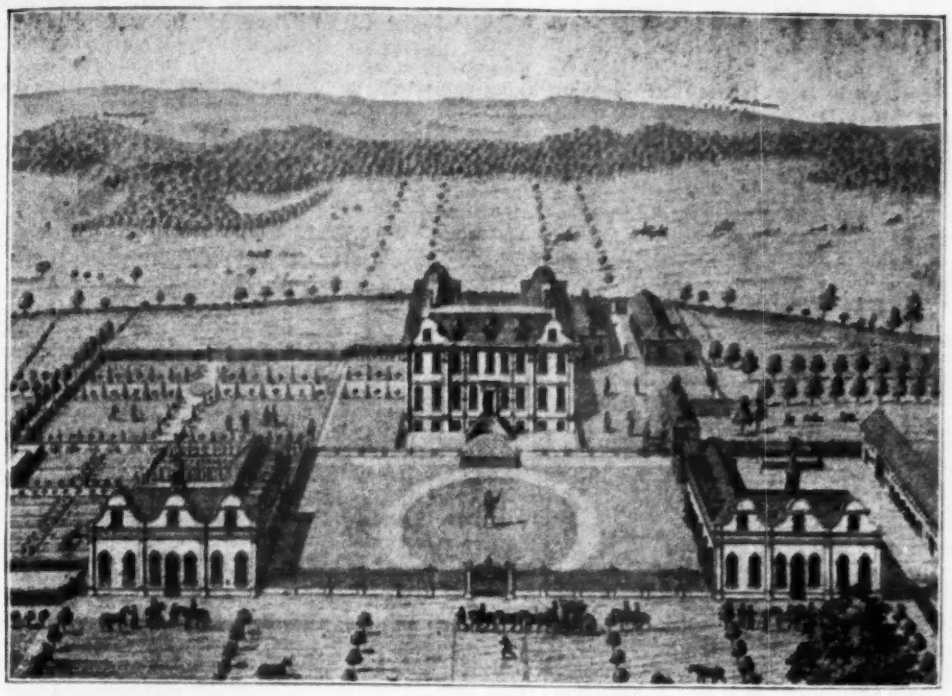
THE ARCHITECTURAL ASSOCIATION OF IRELAND.

OPENING MEETING.

The opening meeting of the session of this Association was held on the 9th inst. in the Grosvenor Hotel, Dublin. Mr. Frederick Batchelor, F.R.I.B.A., President of the Association, occupied the chair, and there was a large attendance. Mr. Frederick G. Hicks, one of the hon. secretaries, read a report dealing with the work of the last session. The report stated that progress was maintained during the session, and several lectures, both of historical and practical interest, were delivered at the meetings. The report was adopted. The President announced that the prize of 10*l.* 10s., offered by the Royal Institute of Architects of Ireland for the best sketch design of a town hall for a provincial town, was won by Mr. Edwin Bradbury. The Institute had consented to offer a similar prize for next year, but it would be given in the form of a travelling studentship. The President then delivered his inaugural address, dealing with the subject of "The Technical Education of the Architectural Student," of which the following is the most important portion:—

"The day when a Department or State-aided institution of Imperial education shall foster and formulate all educational effort and choice, mapping out the whole region from infancy to maturity and the various courses suitable for all ranks and capabilities, and offering the best and cheapest facilities for direction and advice at all cross-roads, is as yet far distant. It is only of late that the teaching guild has begun to codify its haphazard methods and to build up the belated science of education that should guide and foster its art. As its methods are mainly empirical, gained through the garnered wisdom of years, sweeping changes are fraught with great danger. Our system of general education, such as it is, has been reached only through the failure of the unfit and the survival of the fitter, and we can only feel our way to the fittest by affording facilities for all degrees and kinds of technical education, grafting new branches on the stem to the best of our judgment, and watching results here and in other countries. Already we have many bodies working on independent lines, but in the hope of a *rapprochement* that may produce a common policy if not the State-aided amalgamation towards which legislation is gravitating. The University of Dublin did much in preceding Oxford and Cambridge in the establishment, however much it may leave to be desired, of a Faculty of Engineering. The Royal Hibernian Academy, the Department of National Education, the Science and Art Department and its recent local outcome, the Department of Agriculture and Technical Instruction for Ireland, and our municipalities and townships have been by no means idle, but none have done enough to preach. Were they, however, patriotic enough to join in a torchlight procession into the darkness where each would contribute to the general illumination we would have every right to be sanguine.

The elements of some such movement are at hand, and the publication last June by the Department of Agriculture and Technical Instruction for Ireland of 'Suggestions for the Guidance of Local Authorities and Others in Preparing Schemes of Technical Education,' and the 'Statement of the Views of the Technical Education Committee for the City of Dublin on the Future Position and Functions of the Royal College of Science for Ireland with reference to Technical Instruction as related to Industries and Agriculture in that Country,' which appeared about the same time—pamphlets well worthy of your study—are prophetic of the *nexus* that is so much needed. I include in these elements not only those that have already found definite expression, but that desire to co-operate, latent or patent,



Four Oaks Park: Designed by Sir William Wilson. (See "Builder" of September 8.)

OLD HOUSE OF FOUR OAKS PARK, WARWICKSHIRE.

IN our issue of September 8 we published a short article from a correspondent on the life and work of Sir William Wilson, architect and sculptor, and once draughtsman and assistant to Sir Christopher Wren. It was mentioned in that article that the house called Four Oaks Park, built for Lord Ffolliott, of Ballyshannon, and since swept away, was the only one of Wilson's undoubted works of which an illustration remained. The engraving is in Dugdale's "Warwickshire," and the accompanying illustration is copied from it.

The most interesting part in it is the laying out of the ground and buildings. It is to be presumed that the two blocks pushed forward in front, and flanking the courtyard, are buildings for practical or "service" purposes, though so far detached from the house. The stables are easily recognisable in the low block on the extreme right.

which is undoubtedly growing in all professional and commercial bodies in any way interested in technical education. When we realise the extent to which this is growing in Dublin alone; how in the case of the Corporation of Dublin under the patient advocacy of Mr. Arnold Graves this latent desire has become patent to such good effect in the building and organisation of the City of Dublin Technical Schools and Science and Art Schools in Kevin-street; how our own Association has arisen with its growing need for further classes, demonstrations, and lectures; how similar movements have been afoot amongst Irish bankers, chartered accountants, and land agents, it is clear that public opinion is becoming saturated, and that we have but to strain a thread around which these fast forming crystals may gather and build up a solid scheme of coherent and duly related parts.

I do not essay to stretch that thread. The friendly co-operation of years has yet to spin it, and a liberal legislation to provide the *points d'appui*. I can only hasten the formation of a few more crystals in our own little corner of the great solution, in the hope that they may soon trend to their own place in the scheme I have sketched.

Writing recently on the suggestions of the Agricultural Department, the *Irish Builder* stated that the old system of training by apprenticeship to a master had seen its best days, and that, incomparable as it was for laying the solid foundation of a trade or handicraft, it needed nowadays to be supplemented by external training if the artisan or mechanic was to keep abreast of the workers of other countries, such as Germany and America. The remarks apply very aptly to our own profession, where we have only to take a leaf from the book of our surgical brethren and work out a system of lectures, classes, and demonstrations not merely practical but 'clinical.' The Association has already done much to supplement such of these things as are elsewhere available for the pupil and junior assistant, but much more in all branches remains to be done, and I propose, with your help, in the coming session to organise a regular series of technical demonstrations, both at works in progress and also in the workshop. A pupil may know the four volumes of 'Rivingtons' Building Construction' by heart, and have visited all the works on which the staff in his office are engaged, and yet be unfit to supervise for three reasons—firstly, that every class of work does not necessarily find a place in the practice of even a very busy architect during the pupil's *quinquennium*; secondly, that a run of contractors have occasionally been known to do such good work as to deprive the pupils of their legitimate experiences in the rejection of materials and work; and that visits to workshops and manufactories are quite as important as those to works in progress. I propose to meet the first want by arrangements such as have already been made with various architects, and occasionally engineers, to visit the works in progress under their supervision. In this I look for the co-operation of the members of the Royal Institute of the Architects of Ireland and of the Institution of Civil Engineers of Ireland in providing the opportunities, and making the selection as representative and the visits as instructive as possible. It is sometimes forgotten that in many instances architects and engineers are served by the same artisans under the same contractor, and that they have much to learn, especially in their earlier evolution, from one another's work and methods. I do not anticipate insuperable difficulty in meeting the second want, but what we have yet to provide is a systematic series of demonstrations of good and bad materials and workmanship, and the means of distinguishing and appraising them at sight and by applied test, taken, say, in the usual order of a specification. To meet the third want I look for the co-operation of the master craftsmen, merchants, and manufacturers in the neighbourhood of Dublin. So far as I have been able to consult them in the matter, my proposals to throw open the resources of their yards and workshops have been met with such courtesy and approval that I am concerned for nothing but the attendance and appreciation of the members. Let none run away with the idea that I am proposing to run a lot of nursery 'shows' for the benefit of the babes of the profession! I am no Uriah Heep, but I know that I have learnt more since I got out of leading-strings than ever I learnt *in* them, that I have much more to learn than I ever will, and that I and a few other 'grown-ups' hope to learn some of it at these shows! Let none stay away because they think they know too much. We shall want them to teach. We want no drones in the Association Hive. I have been tempted to work out a classification of crafts, showing the order and relation of each in the scheme of their development, like the beautiful Hierarchy of the Sciences which Auguste Comte has bequeathed to us, but it 'won't work,' and if it did I could not fit it to the opportunities, necessarily odd, which have been so kindly held out to us. We must take *what* we can get, *when* we can get it, and all that we can at present hope to do, exclusive of the inspection of works in progress under the supervision of architects or engineers, is to make a series of visits to workshops, stores, and manufactories, in the order most convenient to those principally concerned, during which all processes, tests or 'tips' having to do with our work ordinarily or specially available on the premises will be duly demonstrated.

The timber trades alone will entail several pilgrimages. I question whether the most didactic among us would care to speak *ex cathedrâ* on the article itself. The stereotyped specification founded on the relations, at one time rife, between qualities, uses, ports of shipment, and market forms and marks, is out of date, and the dearth of the dry red deals which stocked Dublin sheds in the good old days has not only introduced a new cult, that of the American balk, but largely increased the demand for second Quebecs, whilst new departures, such as Kauri and Oregon pines, sequoia, canary, maple, and cypress, are courting attention and making new demands on technical demonstration. From the timber yards we might, perhaps, turn to the creosoting works and fill a few pages with notes on the process, the pound per cubic foot injected for various uses, the pressures applied, and the depths of penetration. A visit like this, where we could handle the stuff, compare a few sawn sections, and pump the showman for all we were worth, would teach us more than a dozen text-book descriptions. After such a pleasant diversion, our attention should be ripe for the saw-mills and the carpentry and joinery shops.

The variety of sawn scantling now imported, especially from the Baltic, renders the appreciation of market forms in the importer's yard less problematical than when it was more confined to the log and the balk, but it is in the saw-mills, perhaps, that we have most to learn from technical demonstration. Here we have not only to note how the log and the balk cut up, but to study the diagnosis of the sawn face, new and old, and the judicious bestowal of a modest fee on the yardman who is told off to see that we don't pick our boards. I imagine that one of the chief advantages of technical demonstration in the joinery shops to a Science and Art pass-man would be the dispelling of his little illusions in regard to the present use of framed floors and tongued and grooved back linings in cased frames. What a shock to discover that the girder and the binder have been ousted by the steel section; that the insinuating steel nail makes a better edged joint than the time-honoured tongue; that the tenacious tusk-tenon, the darling of his prettily shaded isometrical details, is practically confined to trimming; and that so great a man as Viollet-le-Duc would drive it even from that refuge. What object-lessons might be afforded in the glueing up of the several parts of doors, sashes, and frames, with a running commentary on the selection of the 'stuff,' the various effects of shrinkage or swelling, and the many little ways of 'slimming' the job. What is even more wanted, because of its comparative neglect in this branch of technical education, is a similar demonstration in the shop-fitting and cabinet-making crafts, crafts whose niceties are only

worked out by the specialist who can get a fair price and escape the demoralisation of the cut-throat competition now being fostered by Government departments. The joiner, too, has much to learn from them, notably the spreading use of the dowel, which seems destined to drive the tenon from all framed woodwork and prove itself a better and a cheaper job. I would conclude the series by an examination of some of the best examples of genuine old joinery and fittings in the last century houses of Dublin, such as still linger in Henrietta-street, Rutland-square, Sackville-street, Kildare-street, or Ely-place, and of the old furniture in the Science and Art Museum, much of which might be measured and drawn with advantage. Few technical studies are so refining in their influence upon the design of architectural joinery as that of the good old furniture of the sixteenth, seventeenth, and eighteenth centuries, and there can be little doubt that the coarseness of the Gothic revival was largely due to its neglect. Another series of demonstrations which would very materially increase our stock of practical knowledge may possibly be arranged in connexion with stonemason's work. In these yards the various building stones in common use for constructional purposes, and also those employed in decoration and in sculpture, could be exhibited, and, I hope, a number of valuable hints obtained from the master-mason's ripe experience as to what quarries have produced the stones best able to resist the disintegrating effects of our Irish climate. We would expect, too, that the flaws and defects peculiar to each description of stone would be pointed out. The methods of setting out the work and the subsequent operations of sawing, dressing, carving, and polishing the stones would be demonstrated.

Then, again, we have in Dublin quite exceptional opportunities for seeing, in well-equipped workshops, art metal work, constructional steel work, and foundry work in all stages of production—where all the processes peculiar to this branch of industry, such as casting and annealing, forging and welding, riveting, galvanising, and what not, could be shown each in proper relation to the other, and where the various tests for castings and steel work could be applied. Most of these shops, too, combine the work of the brassfounder, and the student would therefore be able to investigate the mysteries of casting, turning, finishing, polishing and lacquering of brass and copperwork of all descriptions. I venture to think that if the young architect would avail himself of the opportunities now held out to him to increase his stock of practical knowledge, that knowledge would re-act most beneficially not only on the morality of the master-smith, but on the pocket of his clients. He would no longer create designs, presumably for wrought iron, which could be produced only at excessive cost in that material, or else in the form of a malleable casting which might deceive both architect and client alike.

In the details of plumber's work the average architectural student or assistant is lamentably ignorant. He is probably acquainted with the first principles of sanitary plumbing; he will not, for example, leave a soil pipe without ventilation; he will arrange for the disconnexion of the house drain from the sewer; and he may even provide for a proper current of air through the drains, but when questions are put to him by the ingenious plumber concerning the laying out of the hot water circulating pipes or the connexion of the water-closet trap with the soil pipe he is liable to be placed in a position not entirely compatible with his dignity. A visit to some of the excellent plumbing shops in Dublin would materially increase his knowledge. He would see there the latest types of sanitary appliances, those for domestic use and those specially designed for use in hospitals and asylums, he would learn the best methods of soldering, brazing, and coupling joints of lead and copper pipes, the construction of cylinders, pumps, cooking appliances, &c., not that he would be likely to be called upon to design such articles, but in order that he might be able to distinguish the good from the indifferent or bad.

From plumbling work it is not a far cry, in Dublin at all events, to enter the establishments of the master painters for, in more than one instance, these trades, curiously enough, are combined. From the prominent part the Guild of Master Painters takes in the promotion of technical education in the Kevin-street Schools I have little doubt but that every facility would be afforded for the student to learn much that could not be acquired from books.

Pilgrimages of similar scope, to the haunts of all the crafts that an architect calls to his aid in ecclesiastical, civil, or domestic work are in contemplation.

I have tried to put before you the paramount need of general education, of improved opportunities in the technical training which is our special stock-in-trade, and of the culture which refines their use and combines them to their best ends. Without a full measure of these things ambition is heavily handicapped. I speak, of course, of ambition in its broadest sense—the ambition to deserve and fill a niche in the temple of fame—not the mere instinct of self-preservation and successful plunder which we share with the domestic animal or the beast of prey—the desire to swell the store of wisdom already laid up in technical achievement and record, to raise and maintain the status of our calling, to extend without fear or favour the benefits of our ripe experience, to bear with and live down the prejudices or jealousies of our clients or fellows, and to feel ourselves efficient factors in private, social, and national life—citizens, in fact, of no mean city.

I have not spoken of personal gifts; but without a fair heritage of aptitude, fostered in the hope of something better than bye-ends, the seed may fall on barren soil. If we cannot choose, we can at least cherish them, so that, when our barns and armouries are fuller than those of the less gifted or thrifty, we can at least draw upon ripened grain, or take down a burnished weapon from the rack.

I have pointed out that we have much to enlist both gratitude and hope in the New Department, sop though it be, and I have suggested the ultimate establishment of a vastly more far-reaching scheme of State aid. Charles Lamb has shown us that to look at a gift horse in the mouth is a virtue rather than a vice, and this is especially true of State aid. Those who run the State have in addition to their ingrained aptitude for muddling, and the utter want of anything like business capacity in their nominees, have a pretty habit especially in dispensing political charity of undoing with the left hand what they do with the right. It may be a mistaken interpretation of the divine injunction, 'Let not thy left hand know what thy right hand doeth,' but it is certainly neither business nor charity to set up a standard with one hand and besmirch it with the other. And yet this is what an enlightened government are doing in the matter of technical education!

It is good for reflection to see on the one hand the feverish and belated efforts to provide the technical education which will place the failing artisan on equal terms with his better taught German or American neighbour, and on the other the degradation of both master and man, on which year by year the Government are putting heavier premiums. I have already drawn attention to the inevitable result of cut-throat competition on the conscientious work that alone can train artisans worthy of the honourable name.

How is the master craftsman to get a living price when strikes and the incapacity bred of the Government demand for jerry-work gnaw at one end of his profit, and indiscriminate calls for competition at the other, except by yielding to the temptation, mercilessly held out, of privity in the fraud? It is the knowledge that the degeneration which has followed in the wake of all the crafts that are prone to this evil, namely, those that are commonplace rather than *de luxe*, dates from the introduction and thrives under the curse of competition. It is this knowledge I say that has often induced concerns run on business lines to eschew competition and to act, as notably the Belfast Banking Company did some years ago when they asked their architect, Mr. W. H. Lynn, R.H.A., to select the best contractor he could get for their new bank in College Green, and settle a fair price. They knew that it was folly to put supervision to the test of getting what Mr. Ruskin has very properly termed 'loving work' out of the signatories to the lowest tender, or to expect culture enough in a casual jury, possibly content with railway station standards, to uphold the condemnation of work not obtrusively moribund or coarse, and they acted on their knowledge, with the result that the building is an object-lesson in material and workmanship.

I believe that this is the real plague spot in our sytem, and that it behoves every good citizen who has the progress of technical education in Ireland and the Empire at heart to lend his influence to root it out, and render it less increasingly difficult to find what should never be divorced, namely, conscience and skill in the worker."

Illustrations.

WALSALL MUNICIPAL BUILDINGS: COMPETITION DESIGN.

We give this week the perspective views, elevations, and plans, of the design submitted by Mr. W. A. Pite and Mr. R. S. Balfour in the competition for Walsall Municipal buildings.

In regard to the general intention of the design, the authors write:—

"The disposition of the plan was governed by our reading of the conditions, which asked for the principal entrance from Lichfield-street. This a very important thoroughfare. Leicester-street is an insignificant street, and any entrance would not be seen well, and there would be a long flank wall.

Ancient lights also restricted the plan.

We considered our extension—*i.e.*, in the very spacious internal court—a novel and very important point, as each department, or most of them, could be extended on their immediate floors."

The design is the one which was described and criticised as "No. 4" in our review of the drawings; but this was only a distinguishing number; in order of merit this design was placed third.

From the architect's Report, sent in with the design, we take the following further particulars.

It was made an object to keep the buildings within an angle of 45 deg. from the lowest window adjacent (see elevation to Lichfield-street), and with this object also the tower, suggested as a future addition, was placed at the further end of the main front. These considerations led to the remodelling of the municipal apartments on the Lichfield-street front. The assembly-room is kept separate, with an entrance-hall and crushroom at the Lichfield-street end. Numerous exits from the corridors are provided, so that the building could be cleared in a few minutes.

The boilers and other machinery would be placed in a water-tight concreted area, provided with pumps in case of emergency.

The Leicester-street site seemed the most appropriate for the art gallery; the plan, however, shows only a suggestive scheme, which is shown to indicate a possibility of linking it up with the whole scheme of the Town Hall and municipal buildings, and affording an additional exit to Leicester-street.

The principal fronts were to be executed in Hollington stone, and the roofs covered with sea-green slates; portions of the side fronts, and all elevations to internal courtyards to be of Leicester Heather brick and Whitfield's pressed Paddock bricks. Floors to be fireproof, and strong rooms to have direct foundations, and be constructed with expanded metal embedded in concrete.

The heating was to be by low-pressure steam; the general rooms heated by low-pressure radiators, the air being taken from the outside through air bricks. Corridors to be heated by non-ventilating radiators. In rooms with fireplaces the extraction to be through the fireplaces. The great hall was to be mechanically ventilated on the plenum system, with extraction at floor level to an upcast shaft.

The estimated cost is 54,800*l.*; adding 2,000*l.* more for the portion of the tower above the line of parapet.

SKETCH DESIGNS FOR TAPESTRY PATTERNS.

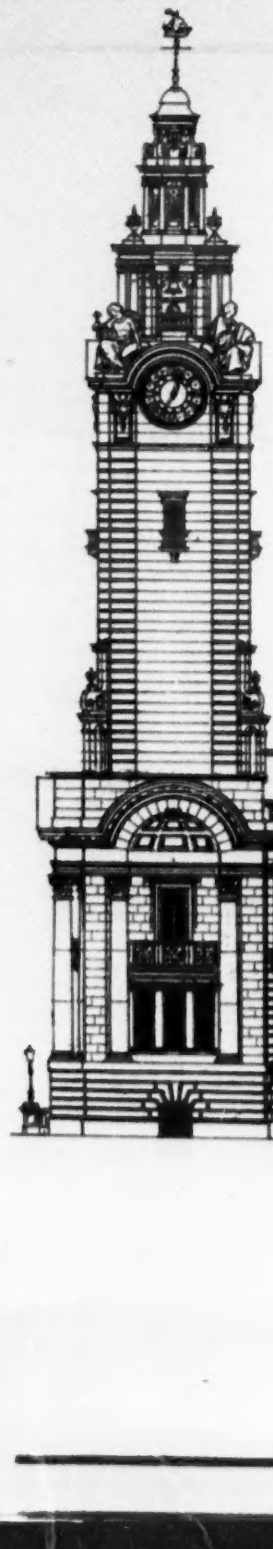
The designs for textile patterns here illustrated in monochrome are reproduced from a sheet of small sketches in water-colour, shown at the last exhibition of the Royal Academy, and are to a scale of about one-tenth of actual size.

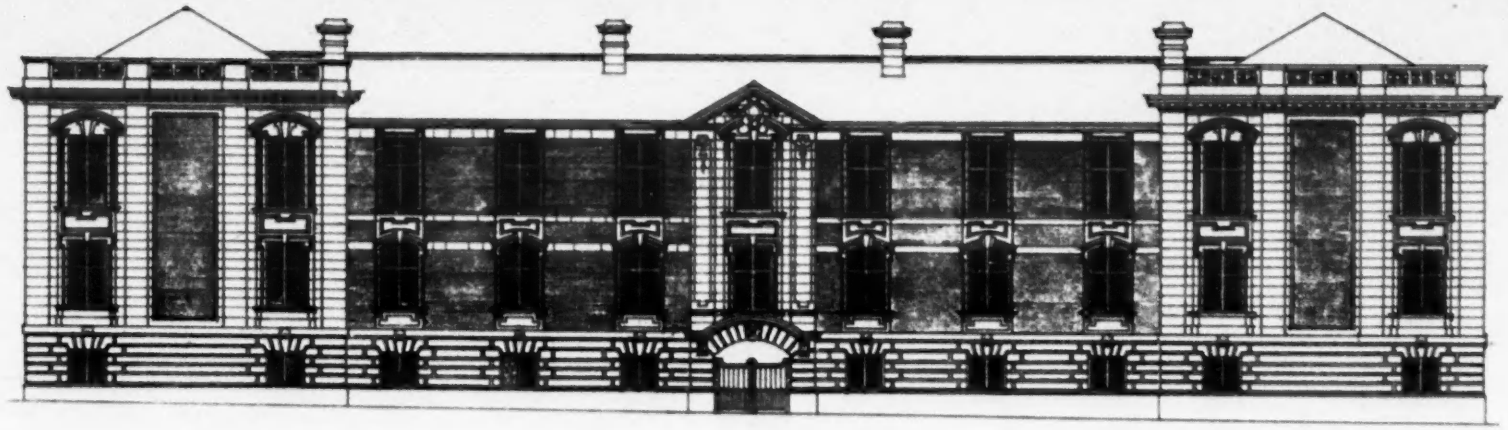
The original drawings represent quick sketches recording the designer's first impression for a projected pattern and its effect in colour, before proceeding with the enlarged design, in which, while the general scheme

THE BUILDER, OCTOBER 20, 1900

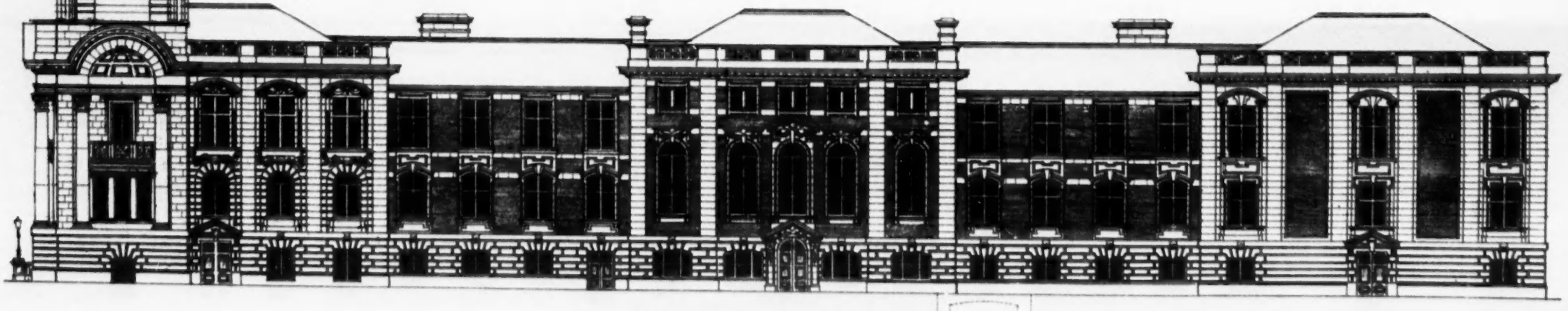
NEW MVNICIPAL BVILDINGS WALSALL.

FINAL COMPETITION





ELEVATION TO DARKWALL STREET
(AS IT WILL BE WHEN COMPLETE)



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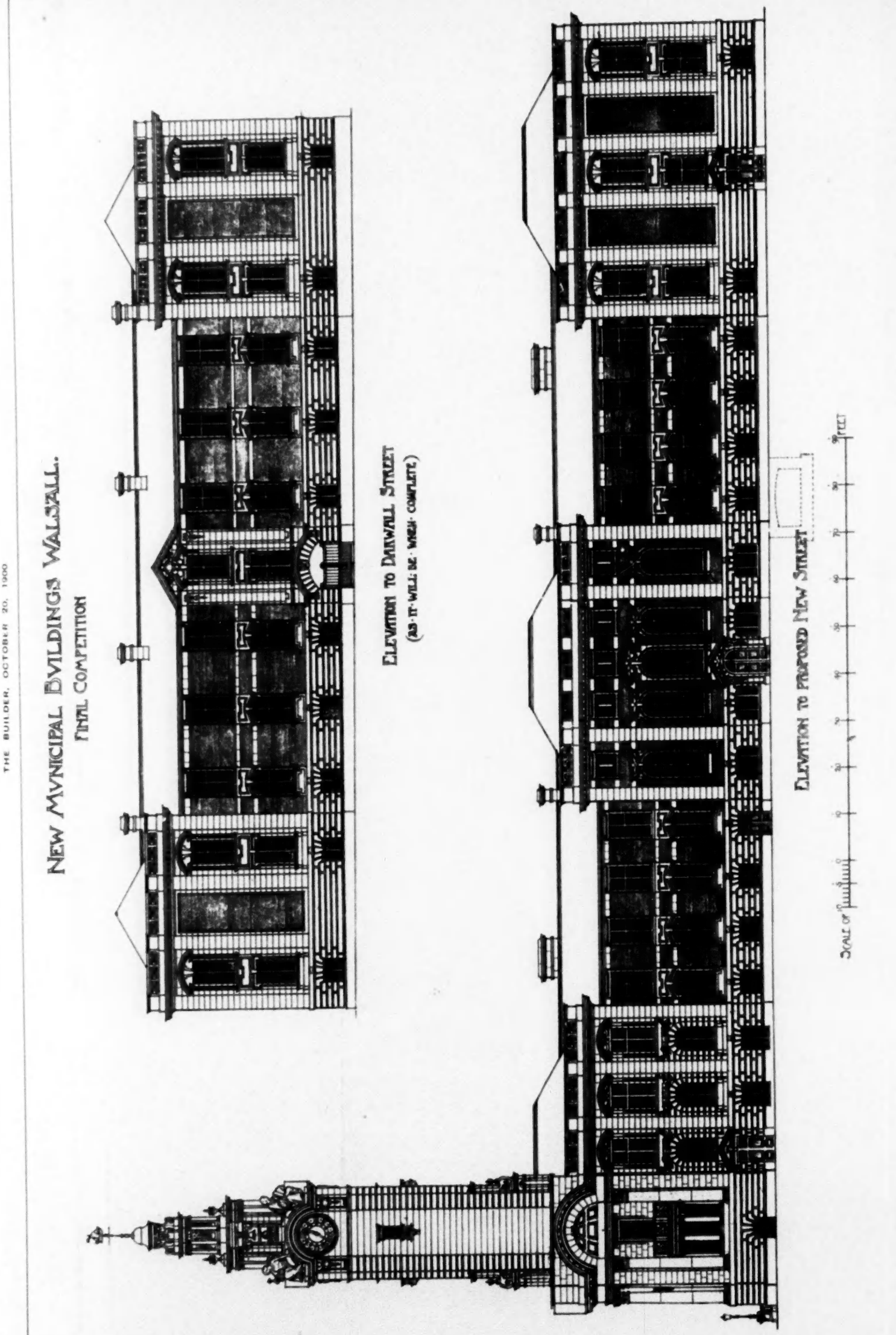
NEW MUNICIPAL BUILDINGS WALSALL.
FINAL COMPETITION
ELEVATION TO DARWALL STREET
(AS IT WILL BE WHEN COMPLETE)
ELEVATION TO PROPOSED NEW STREET
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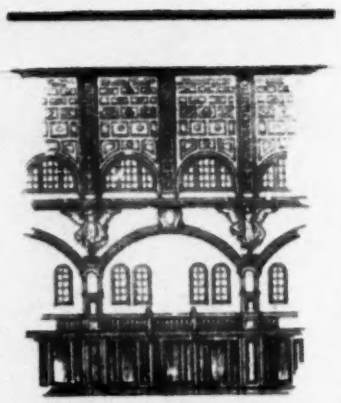
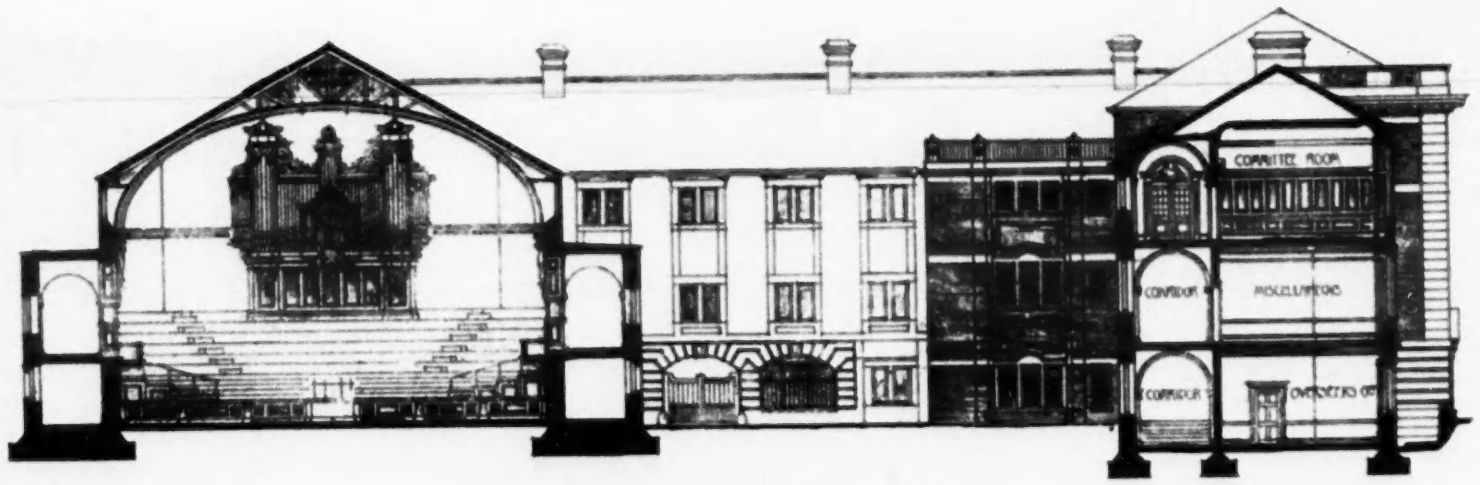


ELEVATION OF ONE BAY OF INTERIOR OF TOWN HALL



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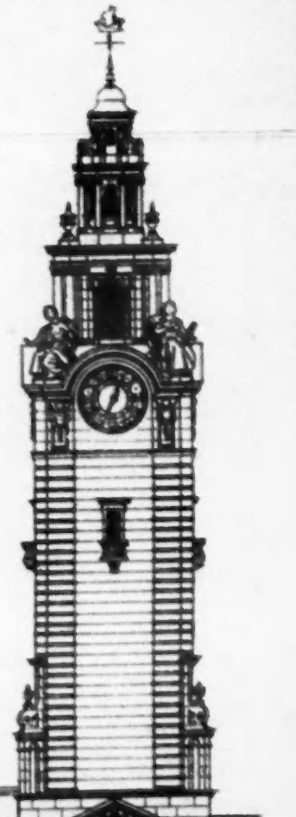
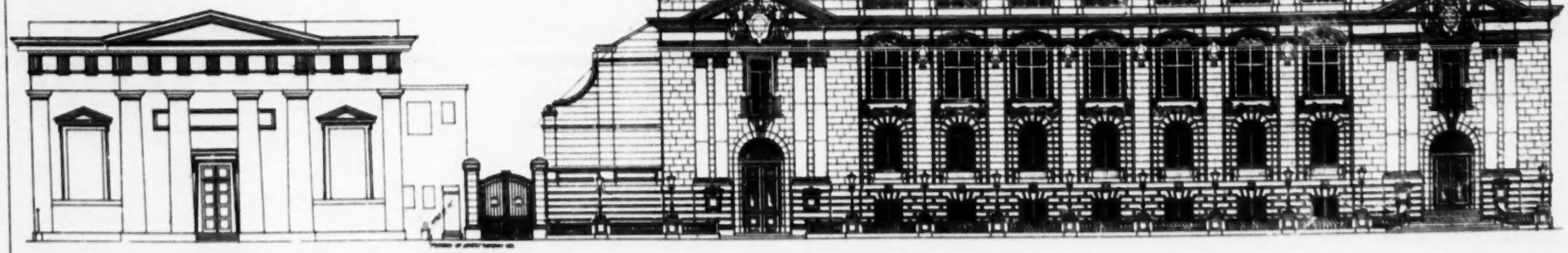




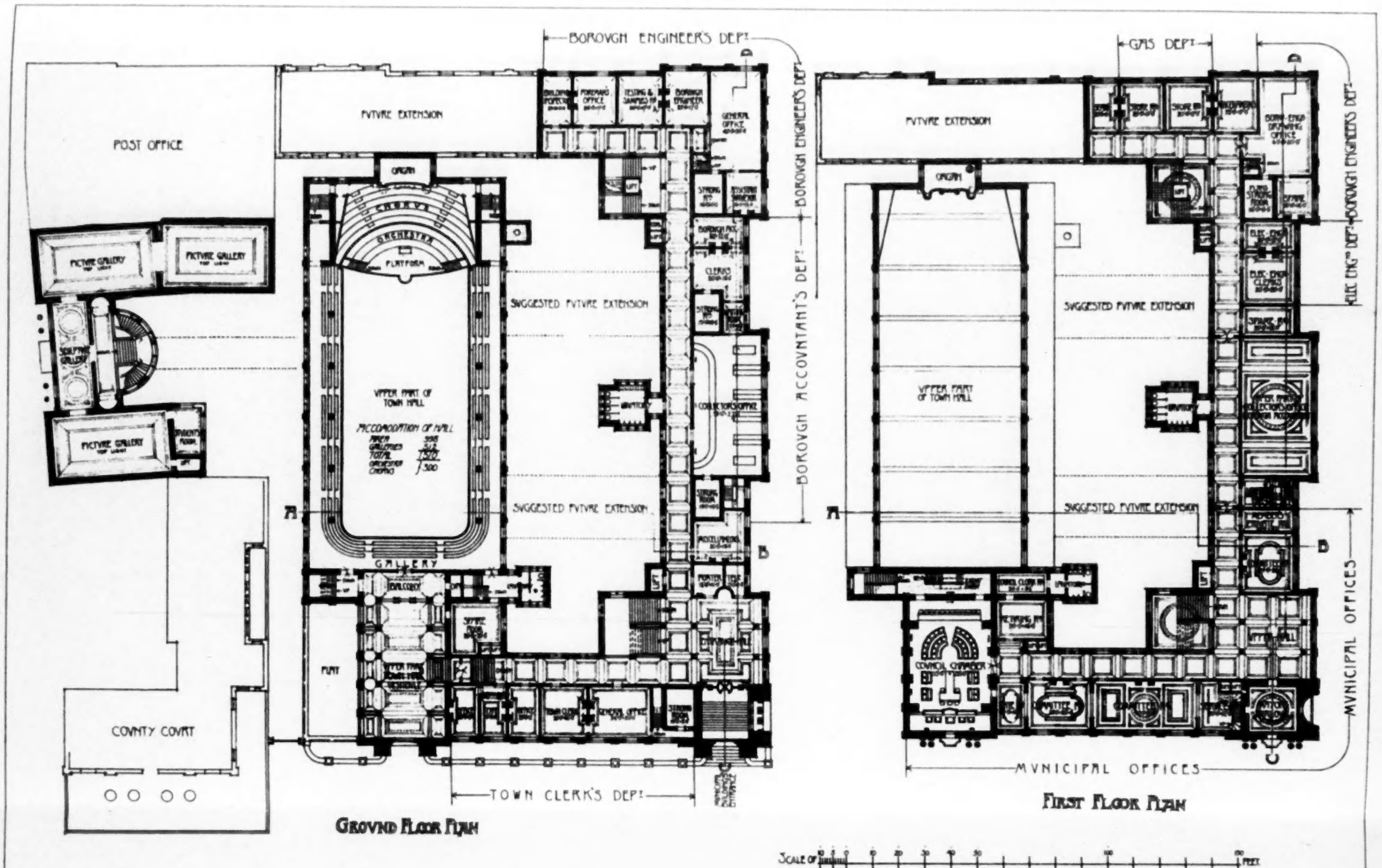
COUNTY COURT

ELEVATION TO LICHFIELD STREET

PHOTO-LITHO SPRAGUE & CO LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

WALSALL MUNICIPAL BUILDINGS COMPETITION.—DESIGN SUBMITTED BY MR. W. A. PITE, F.R.I.B.A., AND MR. R. S. BALFOUR, A.R.I.B.A.

ELEVATIONS AND SECTION.



GROVND FLOOR PLAN

FIRST FLOOR PLAN

SCALE OF FEET

GROUND FLOOR PLAN

FIRST FLOOR PLAN

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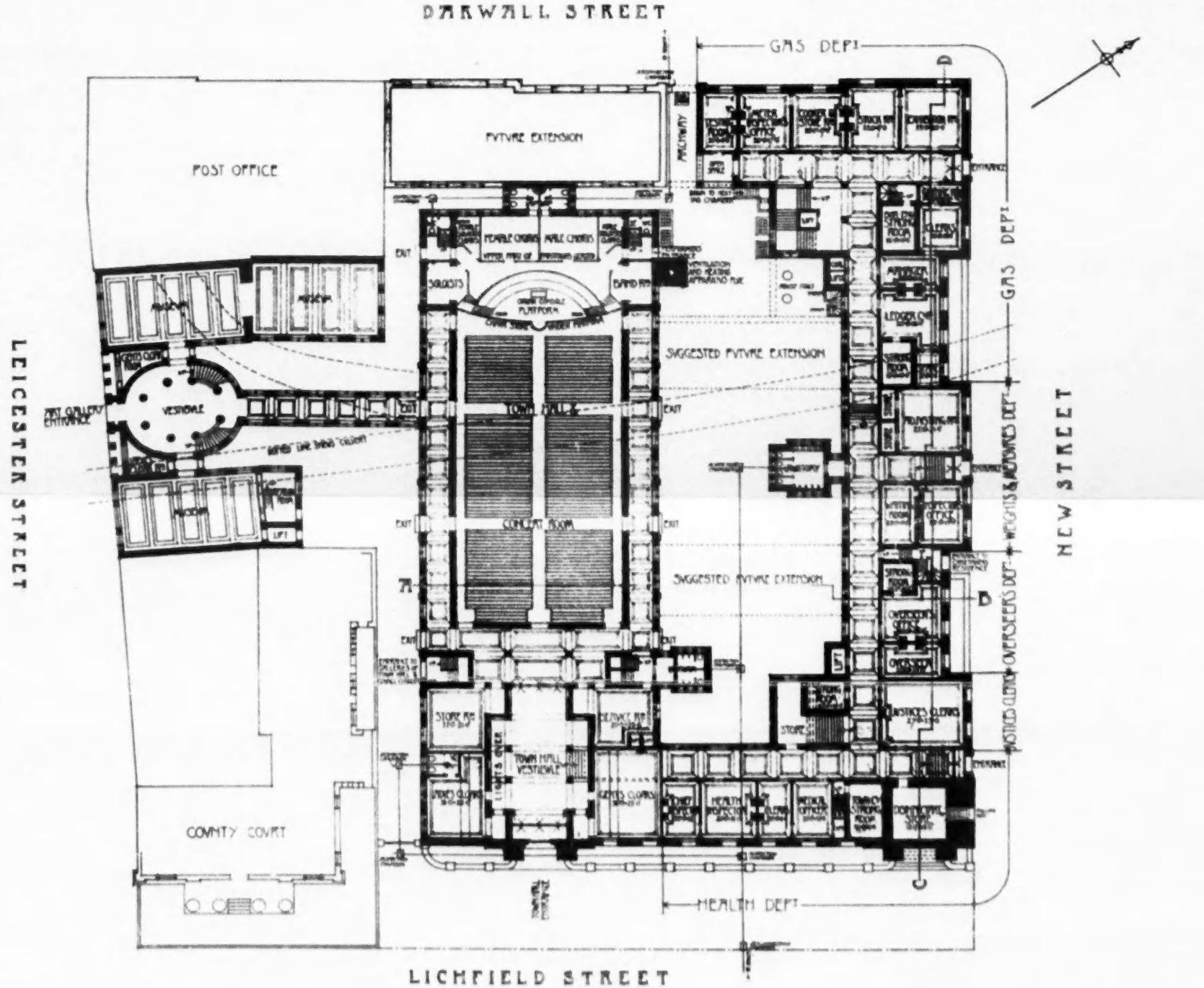

BASEMENT FLOOR PLAN

INK PHOTO. SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

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PLANS.

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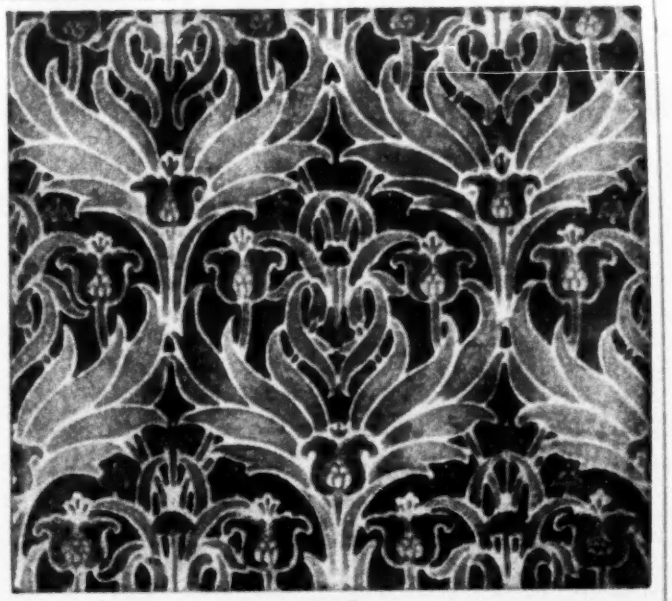

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·SKETCH-DESIGNS·
FOR TAPESTRY PATTERNS·

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IBX. PHOTO. SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

PERSPECTIVE VIEW FROM POINT ASKED FOR.

WALSALL MUNICIPAL BUILDINGS COMPETITION.—Design submitted by Mr. W. A. Pite, F.R.I.B.A., and Mr. R. S. Balfour, A.R.I.B.A.

EXTERIOR PERSPECTIVE.

THE BUILDER, OCTOBER 20, 1900.

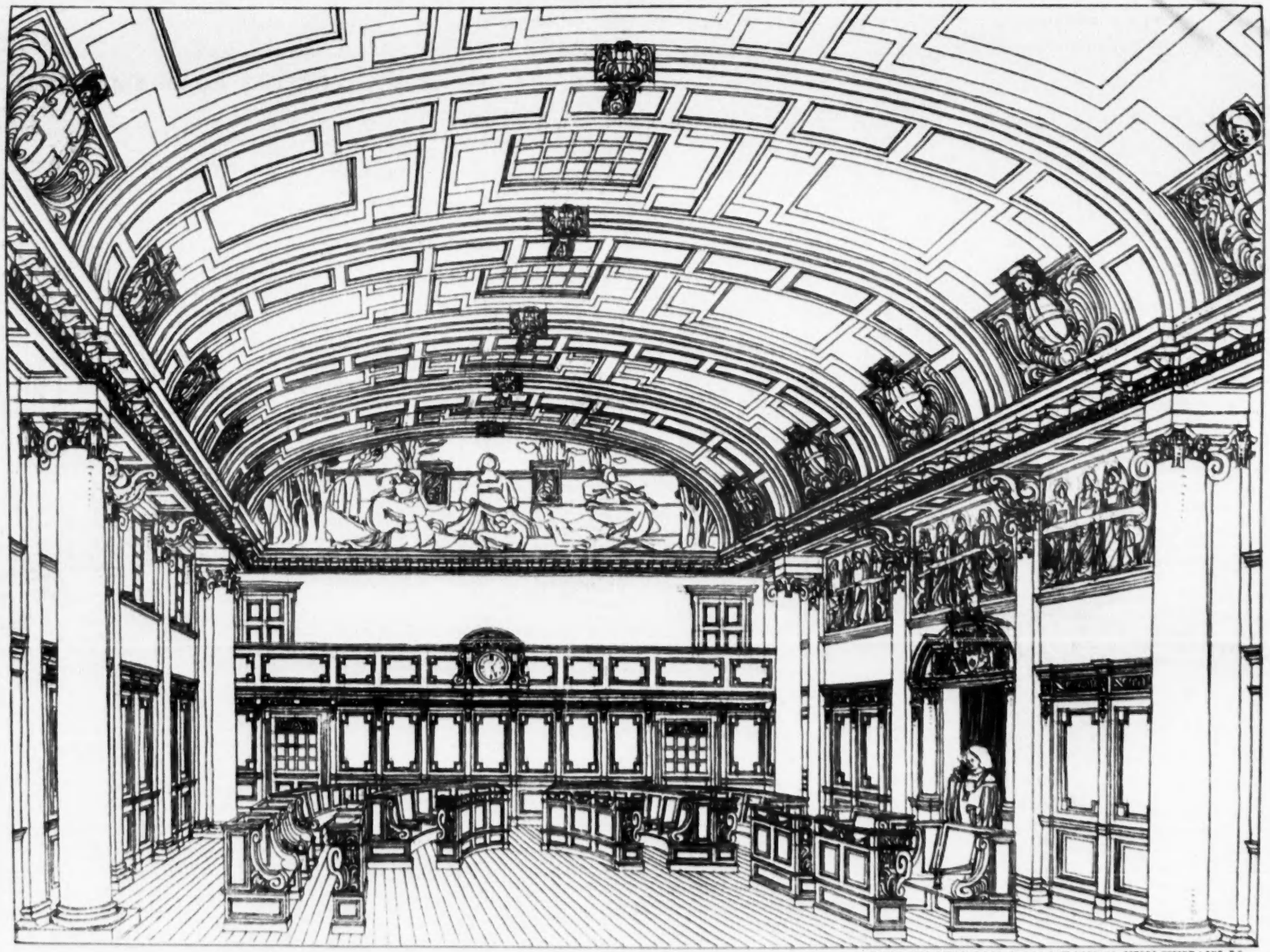

PHOTO LITHO SPRAGUS & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

WALSALL MUNICIPAL BUILDINGS COMPETITION.—Design submitted by Mr. W. A. Pite, F.R.I.B.A., and Mr. R. S. Balfour, A.R.I.B.A.

INTERIOR OF HALL.

the Council's architect. Their report would be made before the exhibition closed and before the identity of the eight architects was disclosed. They were endeavouring to secure the services of a well-known architect, and having regard to the nature and extent of the work involved they were of opinion that a fee of 50 guineas would be a reasonable sum for the Council to pay. They recommended—

(*a*) That the estimate of 50*l.* be approved, and that the Improvements Committee be authorised to take all necessary steps for the exhibition at the gallery of the Royal Society of Painters in Water Colours of the suggested designs for the elevations of the buildings proposed to be erected.

(*b*) That the estimate of 52*l.* 10s. be approved, and that the Improvements Committee be authorised to incur an expenditure of 52*l.* 10s. in obtaining expert advice upon the designs in question.

These recommendations were agreed to.

Proposed New Lambeth Bridge.—The Bridges Committee submitted a special report on the unsatisfactory condition of Lambeth Bridge, and mentioned that the engineer had presented designs for a suspension bridge and of a more rigid type of construction, known as the "braced-arch type." The Committee remarked that by each of these types of construction a certain extent of camber along the central portion of the bridge is desirable, even at the slight sacrifice of a better gradient for traffic. Owing to the great width from outside to outside of the parapets required for each of the above-mentioned types of bridges (say 66 ft. 6 in. for a suspension bridge and 68 ft. for a trussed arch bridge) to enable them to accommodate two lines of tramway, and for the simultaneous passage of the widest-wheeled waggon with a tramcar at any point, it is necessary to reduced the road gradients and the depth and consequent weight of the structures by dividing their widths by means of central supporting chains or by girders as shown upon the designs. In either type of construction the general width of each road between the kerbs will be 19 ft. 9¼ in., and each of the footways 9 ft. 7⅞ in., but these respective widths will be reduced at the tower entrances to 17 ft. 1¼ in. and 5 ft. 11 in. The clear widths between the piers of the central navigable waterways will in each case be about 353 ft., and the clear navigable heights beneath the bridge platform where it spans the central waterway will be 20 ft. above Trinity high-water mark at the centre of the bridge, reducing to about 16 ft. 2 in. near the piers. The clear navigable waterway between the piers of the two side spans will be about 176 ft. for each bridge, but the suspension type affords about 3 ft. more headway than the braced arch at the centre of the side span, being 13 ft. 9 in. above Trinity high-water mark as against 10 ft. 9 in., and it also provides a considerably increased headway at the sides of the span; but in these positions great headway is less important than in the central opening of the bridge. In another respect the braced arch type of construction gives a great advantage over the suspension type, inasmuch as no land anchorages project above and encumber the space for land traffic at the approaches to the bridge, and no chains or girders obstruct or divide the roadway throughout the length of the side spans, and for a length of about 450 ft. the road between the parapets can be kept at its full width of 63 ft. 6 in. for the accommodation of the land traffic. The cost of constructing either of these types of bridge would probably not differ much. The architectural features shown upon the drawings (which were exhibited in the lobby) were, the Committee added, matters of taste, requiring some little further consideration, and were not to be taken by the Council as in any way final. As the bridge will be situated in the neighbourhood of the Houses of Parliament, which were of the Perpendicular Gothic style of architecture, and as it will lead to Lambeth Palace, which was of a more severe style, it must in some way be made to harmonise with both. They propose, therefore, that one of the best authorities on Gothic architecture of the day should be asked to advise in working out the details of the piers, towers, and abutments of the bridge.

The report was adopted.

Tenders accepted.—The Council accepted the tender of the St. Helens Cable Company in 4,300*l.*, for the supply of electric mains required in connexion with the electric light installation for Victoria Embankment and Westminster-bridge, and that of Messrs. Martin, Wells, & Co., in 11,293*l.*, for the erection of cottages at Trafalgar-road, Greenwich. For the supply of 22,800 tons of lime at the Barking and Crossness Outfall Works, the tender of Mr. Andris-Jochams at 16s. 9d. per ton was accepted.

MEMORIAL TABLETS ON LONDON HOUSES.

The Council of the Society of Arts have had a tablet placed on the front of the house No. 54, Hunter-street, with the inscription—"John Ruskin, artist and author, born here. Born 1819—Died 1900." It may be of interest to our readers to give here the complete list of all the houses in London which have been distinguished by similar tablets, affixed under the care of the Society of Arts. The list up to the present time stands as follows:—

Joanna Baillie, Bolton House, Windmill Hill, Hampstead.
James Barry, 36, Castle-street, Oxford-street.
Elizabeth Barrett Browning, 15, Wimpole-street.
Robert Browning, 19, Warwick-crescent, Paddington.
Edmund Burke, 37, Gerrard-street, Soho.
Lord Byron, 16, Holles-street.
[The house was pulled down in 1889. In May, 1900, Messrs. John Lewis & Son, silk mercers, erected on the front of the new house (now in their occupation) a fresh memorial, consisting of a bronze relief bust of Byron placed in an architectural frame of Portland stone.]
George Canning, 37, Conduit-street.
George Cruikshank, 263, Hampstead-road.
Madame D'Arblay (Fanny Burney), 11, Bolton-street, Piccadilly.
Charles Dickens, Furnival's Inn.
[The whole of Furnival's Inn was pulled down in 1898.]
John Dryden, 43, Gerrard-street.
Michael Faraday, 2, Blandford-street, Portman-square.
John Flaxman, 7, Buckingham-street, Fitzroy-square.
Benjamin Franklin, 7, Craven-street, Strand.
Thomas Gainsborough, Schomberg House (now part of the War Office, Pall-mall).
David Garrick, 5, Adelphi-terrace.
Edward Gibbon, 7, Bentinck-street.
George Frederick Handel, 25, Brook-street.
Sir Rowland Hill, Bertram House, Hampstead.
William Hogarth, 30, Leicester-square.
John Keats, Lawnbank, Hampstead.
Samuel Johnson, 17, Gough-square, Fleet-street.
Napoleon III., 3A, King-street, St. James's.
Lord Nelson, 147, New Bond-street.
Sir Isaac Newton, 35, St. Martin's-street.
Peter the Great, 15, Buckingham-street, Strand.
Sir Joshua Reynolds, 47, Leicester-square.
John Ruskin, 54, Hunter-street, Brunswick-square.
Richard Brinsley Sheridan, 14, Savile-row.
Mrs. Siddons, 17, Upper Baker-street.
Wm. Makepeace Thackeray, Kensington Palace-green.
John Thurloe, 24, Old-square, Lincoln's-inn.
Sir Harry Vane, Belmont, Rosslyn-hill, Hampstead.
Sir Robert Walpole, 5, Arlington-street.

The Council of the Society of Arts will be glad to receive suggestions from those who know of houses once the residences of celebrated persons, the owners of which would permit the erection of tablets.

Books.

Building Construction and Drawing. By Charles F. Mitchell, Headmaster of the Polytechnic Technical School, &c. Assisted by George A. Mitchell, Honours Medallist Building Construction, &c. First Stage or Elementary Course. Fifth Edition. London: B. T. Batsford, 94, High Holborn. 1900.

THIS is a "thoroughly revised and much enlarged" edition of a text-book which has already been of service to innumerable students. Although designed in the first instance as a guide to the Board of Education's examination in the First Stage or Elementary Course of Building Construction, it really contains much information for more advanced students. The new edition is said to contain 950 illustrations, but only 803 of these are in elucidation of the text, the remainder being copies of the diagrams given in the questions set at the Board of Education's examinations from 1890 to 1900. Over two hundred new illustrations have been added, and many of the old illustrations have been redrawn. Among the new features of the book are the illustrations of the tools used in the different trades and a chapter on "Builders' Quantities." We have noticed a few misprints, such as "being being" (page 14) for (?) "being badly," and "centered" (page 40) for "centred." The dictum that "drawing instruments with needle points should be avoided" will not commend itself to every draughtsman. These, however, are minor details which are scarcely worth mention. The book is a model of clearness and compression, well written and admirably illustrated, and ought to be in the hands of every student of building construction.

Sewage and the Bacterial Purification of Sewage. By Samuel Rideal, D.Sc. (Lond.), F.I.C., F.C.S., &c. London: Robert Ingram, Pleydell House, Fleet-street, E.C. 1900.

The title of this book appears on the title-page as quoted above, but on the cover of the book it is given as "Sewage and Sewage Purification." The longer title is the more appropriate, as the work is, according to the preface, designed to be a *résumé* of "modern ideas of sewer* (*sic*) purification by bacterial processes." We may say at once that no better *résumé* of the subject is possible at the present time. It is only when Dr. Rideal deals with matters outside his provinces of chemistry and bacteriology that there is room for criticism. Thus, the brick-built gully-pit, trapped simply by a flag dipping into the standing water, may be the best of the four illustrated, but it is far from being a perfect arrangement, and the statement on page 10 that the model by-law of the Local Government Board to the effect that "means of access [to privies] must be provided for the scavenger, so that the filth need not be carried through a dwelling," is to a great extent aimed at the evil of back-to-back houses, shows a little want of forethought, as back-to-back houses have necessarily a street on each side or front, and the privies are grouped at the ends of the blocks, with direct access, as a rule, to both streets. Again, the illustration on page 113 is given as an illustration of a ridge-and-furrow system of sewage-distribution adopted in broad irrigation, whereas it is really the common arrangement for intermittent filtration through land; the ridges and furrows for broad irrigation are very different.

These, however, are trifling blemishes. The chapters on Chemical Analysis, Bacteria Occurring in Sewage, Chemical Changes Produced by Bacteria, Sterilisation, and Bacterial Purification—which occupy more than two-thirds of the book—show Dr. Rideal at his best. His conclusions are entirely in favour of "the treatment of sewage on bacterial lines for even the largest centres of population." Architects, who have to consider the disposal of sewage from large houses, schools, and other buildings in the country, will find in the book much valuable information; and to engineers, who wish to be abreast of the latest knowledge and are desirous of avoiding the dangers which accompany "a *little* learning," the book will be indispensable

A Practical Guide for Sanitary Inspectors. By F. C. Stockman, Assoc. San. Inst., Sanitary Inspector for the Finchley District of Middlesex. With an Introduction by Henry Kenwood, M.B., L.R.C.P., D.P.H., &c. London: Butterworth & Co., 12, Bell-yard, W.C. 1900.

According to the preface, this work is intended "more particularly for those who have just obtained their first appointment as sanitary inspectors," but it will also be of use to older practitioners as well as to students. The matter is carefully arranged and there is no unnecessary verbiage. Much of it is, of course, a mere recapitulation of the Acts of Parliament now in force, but the book also contains much good advice on the details of the sanitary inspector's work. The Infectious Disease (Notification) Extension Act, 1899, is omitted from the list of Sanitary Acts on page 19, but mention of it is made in a footnote on page 112; it is, however, erroneous to say that this Act makes notification "universal," as its operation is confined to England and Wales. We have noticed two or three details on which there is room for difference of opinion, such as the kind of trough-closet recommended and the amount of flush. The method of fixing anti-siphonage pipes where "two or more water-closets" are connected with the same soil-pipe is wrongly described on page 73; it

* Clearly a misprint for "sewage."

would be bad plumbing to make a separate anti-siphonage pipe for each closet "by connecting a short piece of lead pipe with the top of the trap to the soil-pipe." The book is well printed, and the descriptions are on the whole so well expressed that the lack of illustrations is scarcely noticed. We can heartily recommend the book as a practical guide for sanitary inspectors both in town and country.

Defects in Plumbing and Drainage Work. Described by FRANCIS VACHER, Medical Officer of Health for Cheshire. New and Enlarged Edition. Manchester: John Heywood. 1900. Price 1s.

THIS is an illustrated account of about 120 defects in plumbing and drainage work which have come under Dr. Vacher's own observation or have been described to him by correspondents. Some of them are such curious examples of misplaced ingenuity as might appear incredible, but that similar or even worse defects have come under our own observation. The book is on the same lines as Dr. Teale's "Dangers to Health," but is published at the small price of one shilling in order that it may circulate widely among artisans. Much can undoubtedly be learnt from a careful study of the defects which Dr. Vacher has described, and it would be a good thing if every plumber and drainer would read the book so as to know how *not* to do their work. It is a pity that the illustration on page 41 has been allowed to remain; a wash-down closet with a fan-spreader (instead of a flushing rim) ought not to have been recommended in 1900, whatever may have been thought about it eleven years ago, when the book was first published.

Gas, Oil, and Air Engines. By BRYAN DONKIN, M.Inst.C.E., &c. Third edition; revised and largely rewritten. Charles Griffin & Company, Limited, 1900.

THIS book is already well known to the engineering world as a standard work, superior to any other dealing with gas, oil, and air engines. As an author, Mr. Donkin possesses the advantage of a long practical experience in addition to theoretical knowledge of a high order. He is therefore well able to appreciate the importance of points upon which engineers and others are most likely to require information. His work bears unmistakable signs of painstaking research, and the voluminous details it contains are set forth in a manner which leaves little to be desired. Mr. Donkin is descriptive rather than argumentative, and moreover he is merciful to the general reader who may require information, for his pages are not overrun with abstruse calculations of the kind which take away so much of the interest and usefulness, except, of course, to professional engineers, of many technical works.

Gas-engines are now being adopted for so many different purposes in connexion with private and public buildings of all kinds that the architect is frequently called upon to advise as to the relative suitability or efficieny of certain gas-engines, or he may have to decide whether a gas or a steam-engine should be employed in some particular case. It is one of the privileges of the architect that he is frequently expected to be an expert upon anything which finds its place within the walls of a building. Consequently, he may occasionally discover that the acquisition of supplemental knowledge is very desirable. If information of the kind be required as to gas and similar motors, the inquirer may be sure of finding what is wanted in Mr. Donkin's admirable treatise.

The Timber Merchant's and Builder and Contractor's Calculator. By JOHN ROBERT BARKER. Published by the Author (no date or address).

MR. BARKER'S little book of sixty-six pages contains a considerable amount of information which may prove useful to builders who are in a small way of business. It is not, however, sufficiently complete to be of much service to more important firms or to the timber merchant. Nothing is said about any other standards than the St. Petersburg; this, of course, is the most important; but at the very least multipliers ought to have been given for converting this into other standards, such as the Quebec, London, Christiania, &c., and *vice versâ*. Then, again, only the quarter-girth system of measurement is given for round timber, and nothing is said as to allowances which are made in the dimensions of logs, although this is a matter of great importance in the case of many of the more valuable timbers, such as mahogany.

We have not checked all the tables, but in the one we have checked—that on p. 48—the errors are numerous. To begin with, there is an unfortunate omission in the title of the table, which reads "Table showing the proportion in value between timber per load, or per foot cube, and 12-ft. 2½-in. and 3 in. battens, deals, and planks;" "120 pieces" ought to have been inserted before "12 ft." The values are also incorrectly stated. Out of fifty-four values of deals, battens and planks, no fewer than thirteen are inaccurate, the errors ranging from 6d. to 2*l*. If there is one essential in a work of this sort, it is accuracy, and we fear, therefore, that Mr. Barker's book cannot be recommended till the calculations have been carefully revised.

Practical Book-keeping for Builders and Contractors. By E. H. MASON. Newport: Geo. Bell. 1900. Price 1s.

THE author of this pamphlet is a corporate accountant and auditor at Newport (Mon.) and may therefore be assumed to be fully competent to treat the subject of account-keeping. His object is to show how the accounts of the average builder may be easily and accurately kept without unnecessary expenditure in large salaries to trained book-keepers. As he observes, "it must surely be better to spend an hour or two daily keeping the accounts in order than to see the credit balance at his bankers growing smaller while large trade is being done, and not know the leakage." The information is succinctly and clearly given, with specimens of columned sheets for the various classes of accounts in connexion with building work.

An Epitome of the Law and Practice connected with Patents for Inventions. By JAMES JOHNSON, Barrister, and J. HENRY JOHNSON, Solicitor and Patent Agent. Third Edition. London: Longmans, Green, & Co.; Stevens & Sons, Limited. 1900.

THERE is little to be said of this convenient handbook. It is in effect a sketch of the law and practice clearly and concisely stated. It is useful for those who wish to obtain a general idea of the law of patents, and how one is to be obtained. It is too slight if some particular point in regard to patents has to be elaborately made up. But it is obvious that it is a book which supplies a want.

COMPETITIONS.

TECHNICAL SCHOOL, BURNLEY.—The assessor who has had the plans before him of the new technical and higher grade school at Burnley has given his award in favour of the design marked "C." The author of the design is Mr. T. Bell, of Burnley.

BOOKS RECEIVED.

THE CHEMISTRY OF ENGINEERING. By A. H. Sexton. (Technical Publishing Company, Manchester).

THE GEORGIAN PERIOD: Being measured drawings of Colonial work. By C. F. Bragdon, F. J. Kidd, J. F. Scrobel, jun., C. L. Hillman, F. S. Swales, and S. R. De Long (Office of the *American Architect and Building News*, Boston, U.S.A.)

PRACTICAL BOOK-KEEPING FOR BUILDERS AND CONTRACTORS. By E. H. Mason. (Newport: G. Bell)

ARCHITECTURE AND HISTORY, AND WESTMINSTER ABBEY. By William Morris. (Longman & Co.)

CHARING CROSS AND HAMPSTEAD RAILWAY.—Sir Douglas Fox and Mr. W. R. Galbraith have been appointed engineers for the construction of the electrical railway, in respect of which a company was incorporated in August, 1893. Under the modified plans the line, a branch from Park-street, Camden Town, to Kentish Town included, will be about six and a half miles long, and the estimated cost is nearly 4,000,000*l*. The railway and plant will be after the latest American patterns, the third rail serving as a feeder for the motors. The project, we understand, has been taken over by a syndicate of New York capitalists, whose chairman is Mr. C. T. Yerkes, a well-known street-railway builder in America, and donor of the great telescope to the Yerkes Observatory at Geneva, Illinois.

Correspondence.

To the Editor of THE BUILDER.

ARCHITECTURAL EDUCATION.

SIR,—I notice in last week's *Builder* that Mr. Seth-Smith advocates a two years preliminary training for architectural students in London. It is now six years since I started such a scheme at University College, Liverpool, and my experience, therefore, may be of some interest to those who, like myself, believe that this is the right course to pursue. In 1894 I started with one student. During the past three years I have had, on an average, sixteen students each year taking the two years course, and this year I have nineteen passing through it; seven in their second year and twelve in their first. Some of the advantages of such a scheme you referred to in your "Note" on Mr. Seth-Smith's address. The principle advantage, however, is that the student commences work at the beginning and is taught systematically. None of his time is wasted on work which he cannot understand, as is too often the case when he enters an office straight from school or college. So much is omitted in office work, being understood, that it is sometimes difficult for a pupil to get behind the scenes and understand why things are done, and the reasons for the different methods of construction adopted. There is no danger of this in a systematic course of preliminary training. Opinions may differ somewhat as to the details of any scheme, but that is immaterial. The great thing is to agree on the need for a change in our present methods of training architects. I have no doubt whatsoever that if such a scheme, as is suggested, were started in London, it would be a success. If I can get nineteen students in Liverpool it ought to be possible to get five times that number in London. The fees here are low, 25*l*. a year; in London they could be at least 40*l*. Supposing that only fifty students joined, that means an income of 2,000*l*. a year. Mr. Seth-Smith's estimated expenditure of 1,000*l*. a year is altogether too low. It would probably eventually be nearly treble that amount, but even if it were I believe that the scheme would still be a financial success.

The only point I am doubtful about is whether the Architectural Association is the proper body to start such a scheme. Nobody knows better or recognises more fully than I do the excellence of the work which it has done in the past, but Mr. Seth-Smith's italicised proposal of a "purely architectural college" is surely a mistake. The architectural student ought not to be isolated. From the first he should be in touch with the workers in other branches of art, and with the craftsmen and artificers who will in after years be called upon to assist him in his work. He should also, I consider, be encouraged to pursue his studies in general subjects, arts and sciences, before commencing his more technical training. The student with a good preliminary grounding, as I know from experience here, learns ever so much more quickly than one who is deficient in this respect. For these reasons I think the new University of London should be pressed to undertake the work, and I hope that all who are interested in improving architectural education in this country will support the efforts of the President and Council of the Royal Institute of British Architects in their desire to see architecture included in the curriculum of the University. But, in my opinion, it is necessary not only to include architecture but also the other arts and crafts allied to it. This would be a large order no doubt, but it is worth trying for. From letters I have received lately I gather that somewhat similar schemes to the one suggested are about to be started in other large towns, and the new developments at the College of Art, South Kensington, may also tend in the same direction.

F. M. SIMPSON.

University College, Liverpool.

ANCIENT CARTHUSIAN MONASTERIES IN ENGLAND AND SCOTLAND.

SIR,—I am desirous of finding a plan, picture, or engraving of the following monasteries as they existed when occupied by the Carthusian monks:—Witham, Hinton, Sheen, Totnes, London, Coventry, Hull, Beauvale, Mount Grace, Epworth (Axholme), Oakham, and Perth.

Will you permit me to ask the kind assistance of your readers? CHARLES C. THORNTON.

The Student's Column.

LESSONS IN ELECTRICAL ENGINEERING.

14. Methods of Charging for the Electric Light — The Hopkinson and Wright Systems — The Wright Demand Indicator—Free Glow Lamps —Meters—Best Known Types—Tests —The Eversbed Meter.

MANY consumers of the electric light are puzzled by the extraordinary systems of charging for it adopted by supply companies and corporations. If every company adopted a similar system, the public would try and understand the reason for it, but as there are some twenty or thirty different systems in use the labour involved is too great. Yet there are one or two main principles underlying them all, and a study of these will be instructive. The late Dr. Hopkinson was the first to propose that every consumer ought to pay his fair share of the "standing charges" to which he put the company, as well as his share of the "running charges." The "standing charges" include such items as salaries, rent, depreciation, &c., and the "running charges" include the price of the coal, water, and lubricating oil used. If all the consumers had mansions wired for a great number of lamps, and only kept these lamps burning for a few hours on special occasions every year, it will be obvious that the machinery at the central station must be large enough to cope with these special demands, and yet the greater part of this expensive machinery will be nearly always lying idle, and it will be depreciating in value all the year round.

The same problem occurs in supplying many other wants. Railway and omnibus companies have to keep a much larger running stock than if their clients arranged their journeys so as to distribute the load evenly throughout the day. Even in gas and water supply notwithstanding the ease with which they can be stored, this difficulty comes in. What the supply companies want for economical working is an evenly distributed load throughout the day so that they can supply the demand with the smallest plant and the most effective staff.

In electricity supply these considerations have special force because the plant must be sufficiently powerful to take the maximum load which, from the nature of the case, only occurs for a few hours every winter. If the meter bills of consumers are not sufficiently high to pay the "standing charges," then these consumers are a loss to the company and prevent the small consumer, who takes no long holiday every year and uses his lamps regularly, from getting the rebate to which he is in equity entitled. Yet in several towns in which the Hopkinson method of charging has been introduced, the consumers who get no rebates have protested against the system on the ground that they are paying for the current consumed by the consumer who gets a rebate. As a matter of fact, the opposite is the truth. The most profitable class, who get the largest rebates, still pay more than their fair share of the expenses of generating and distributing the electricity.

There are three principal methods adopted of charging for electric light and power. In the first method a fixed charge per unit is made, the energy supplied being measured by a meter. The second method is to make a fixed charge per annum for the number of lamps installed, and in addition to make a charge per unit as measured by the meter. The third method, which is due to Mr. Arthur Wright, of Brighton, is to charge for electricity consumed at a fixed rate, and give rebates depending on the maximum demand made during the quarter under consideration.

In Manchester both the first and the second methods are employed, and consumers must choose the method they elect to be charged by and must abide by their choice for, at least, twelve months. The scale is as follows :—

1. A fixed price of 5d. per unit, or

2. A fixed charge of 7*l.* per annum per kilowatt installed, *i.e.*, for every sixteen 16 c.p. lamps installed, and in addition a charge of 1½d. per unit for electrical energy taken.

Which system to adopt is a matter of considerable importance to a consumer. If he calculates that he will use his lamps on an average for one hour every day in the year. Then on the first system his meter bill would be for 365 units for every 16 lamps and would amount to 7*l.* 12s. 1d. per kilowatt demanded. In the second system it would be 7*l.* + 365 units at 1½d., *i.e.*, 8*l.* 18s. for every 16 lamps. If he used his lamps on an average for three hours every day, then on the first system his bill would be 22*l.* 16s. 3d., and on the second 12*l.* 14s. 1d. It will be seen that an error in guessing what his probable demand may be, may lead the consumer into considerable expense.

In order to apply the "Wright" system of charging, we need in addition to the meter to have some instrument to indicate the maximum current that has been taken during the quarter. In this country the instrument employed for this purpose is the Wright demand indicator. It consists simply of a differential air thermometer made of a glass U tube with two glass bulbs blown at each end and partly filled with coloured sulphuric acid. A small platinoid resistance coil is wound round one of the bulbs, and is in series with the mains. When a current passes the air in one bulb being hotter than the other, the liquid is forced up one side of the U-shaped tube, and part of it falling into the other bulb is stored there, and is used to measure the maximum current. It is sluggish in its action, and hence an accidental short circuit or turning on a great many lamps for a minute or so will not make it register. It can be set at once by tilting the tube, and there is nothing in it liable to get out of order.

The Islington scale is :—7d. per unit for the first hour per day of the maximum supply demanded, and ¼d. per unit for all in excess of this. For example, supposing that the meter showed that 150 units had been consumed during the quarter, and the indicator that the maximum demand had been at the rate of 1½ units per hour, then the bill would be for 91 × 1½ units at 7d. (counting ninety-one days in the quarter) *i.e.*, 104 units at 7d., and 46 units at 4d., or altogether 3*l.* 16s.

At Brighton the scale is :—7d. per unit for the first hour per day of the maximum supply demanded, and 1d. per unit for all over this consumption. At Brighton the maximum demand is not taken every quarter, but is taken as the mean of three readings taken every half-year.

It will be seen that the system of charging, based on the maximum demand as at Brighton, is fairer than that based on the maximum number of lamps installed as at Manchester. It very rarely happens that all the lamps in a house are turned on at one time, and when a demand indicator is fixed the consumer can easily arrange so that the dining-room and drawing-room "loads," &c., do not overlap too much. If he wishes to give an entertainment and have a great blaze of light, then he can arrange with the supply company to cut out his demand indicator for that evening.

It is useful also to consider the methods that have been adopted to encourage a day load on the supply station. The St. Pancras Electricity Supply fixes two meters when desired in a consumer's house—one for a cheap daylight service at 3d. per unit, mainly for power purposes; the other, at 6d. per unit, for lighting purposes. By means of a switch, devised by Mr. J. T. Baron, the consumer can use which meter he likes, but the cheap meter is not on the lighting circuit. Mr. R. P. Wilson has invented a meter which records at different rates at different times. During the day-time, by means of clockwork, a resistance is inserted in the shunt of the meter, which accordingly goes slower, and at night the clockwork cuts out this resistance. There are many other systems of charging adopted, but we have said enough to indicate the principles on which they are based.

Some electric supply companies, in addition to giving rebates on the meter bills, supply their consumers with glow lamps. In America this practice is largely adopted. The Edison companies, for example, when a customer is connected, give him a glow lamp for every socket he has in his house absolutely free, and he can have them of any candle-power he desires. He is also given a few lamps to keep in reserve. Whenever a filament burns out or the candle-power of a lamp falls off he can exchange it for a new one. There is much to be said in favour of this system. From the company's point of view, the satisfaction of the consumer and the certainty he has that he is getting the light for which he pays more than compensate for the cost of lamp renewals.

The ordinary consumer is very loth to replace lamps that burn dimly when he has to pay for them himself. As a rule, he measures the worth of a glow lamp by the length of its life. From the point of view of economy, this is a very mistaken idea. Every seventeen hours an ordinary 16-c.-p. lamp will consume a unit, the price of which we may take at sixpence. In its life, which is often between one and two thousand hours, or even longer, it will consume two or three pounds' worth of energy. As the original cost of the lamp is at the most two shillings, it will be seen that the cost of lamp renewals is only about 5 per cent. of the meter bill; and as lamps often vary in efficiency by as much as 100 per cent., it will be seen that the life of the lamp is not nearly so important as its efficiency.

Before November, 1893, when the patent for glow lamps owned by the Edison & Swan Company expired, the price of them was high (3s. 9d.), but the workmanship was excellent, and every lamp was tested for candle-power, &c., before leaving the factory. Now, when many factories are turning out 20,000 lamps a week labelled 8, 16, and 32 c.-p., and selling them for a shilling each, it is not to be wondered at that many of them do not correspond to their labels, and that some of them are defective. When Bradford changed over from supplying at 115 volts pressure to supplying at 230 volts Mr. Gibbings, the Corporation electrician, tested many of the 115 volt lamps taken from consumers' premises in exchange for 230 volt lamps. He found that in the majority of cases they had been taking from 4 to 6 watts per candle, and as a good lamp will give a candle for every 3 or 3½ watts consumed, many of the consumers had been paying very expensively for their light through the medium of so-called "cheap" lamps.

Now, in order to test a lamp, an expert is required; hence one of the main reasons given why companies should supply their consumers with free lamps is that they are in a position to test the lamps and guarantee their quality, whilst the consumer, if left to himself, will probably buy cheap and long-life lamps, and so pay 50 per cent. more for the light he gets. At Bradford Mr. Gibbings has introduced a modified system of "free lamps." Every consumer there is entitled to an 8 or a 16 c.-p. lamp for every 60 units of electricity he consumes by the use of glow lamps only.

Electricity meters may be divided into three principal classes :—

1. Electrolytic meters.
2. Clock meters.
3. Motor meters.

The first class of meters measures ampere-hours only. As the pressure, however, of an electric supply is practically constant, this is proportional to the watt-hours or energy consumed. If the average pressure for the quarter were 1 per cent. low, then the consumers would be charged 1 per cent. too much for the power they actually consumed; and if the pressure were 1 per cent. high, they would be charged 1 per cent. too little. The best-known type of electrolytic meter is the Bastian meter. The main current passes, by means of platinum electrodes, in and out of the base of a glass tube of uniform bore filled with water, with a small proportion of sulphuric acid added. The more current that passes the more water is electrolysed into oxygen and hydrogen, which escapes into the air; hence the level of the water falls and the calibration along the side of the tube shows the number of units consumed. To reset the meter it is filled with water up to the zero mark. The meter is cheap (2*l.* 10s.), and is suitable for small consumers on 200-volt circuits. A drawback is that there is a drop of two or three volts across the meter, which would represent a serious loss of energy on 100-volt circuits. Its main advantages are accuracy, the registration of very small currents, and freedom from harm by temporary excess currents.

By the London County Council regulations "a meter shall be considered to be correct when the registration shown by the dials is within 2½ per cent. of absolute accuracy at all points above one-twentieth load, or 1½ amperes." This is very much the same degree of accuracy as is insisted on for gas meters. No gas meter is stamped which has an error of more than 2 per cent. in favour of the seller or 3 per cent. in favour of the consumer. The pressure of the gas supply is of secondary importance to the consumer, who is mainly concerned with its illuminating power. Hence there is often a drop of 20 per cent. in the pressure of the gas supply across the gas meter, a drop which, of

course, would be quite inadmissible in the case of electric pressure. This is one of the reasons that make it so difficult to construct an electric meter, the power at our disposal is so small. For this reason the earliest meters invented were either electrolytic or clock meters.

The earliest successful clock meter was the Aron meter. It had two pendulums; the bob of one was magnetic and oscillated in a magnetic field when the lamps in the house were turned on, and so was accelerated at a rate proportional to the current taken. The difference between the rates at which the two pendulums oscillated measured the ampere-hours taken, and this was registered by a differential gear. The meter in its original form was thus an ampere-hour meter, or, as it is sometimes called, a coulomb meter or a quantity meter. It had the great drawback of requiring to be wound every month or so, and required a good deal of inspection. The modern Aron meters are a great improvement on the older form. They are all energy meters, and being motor meters, they require no winding.

The motor meters form by far the largest class. The best known types in this country are the Thomson, Ferranti, Hookham, and Aron meters. In the Thomson meter we have a drum-wound armature placed in series with a high non-inductive resistance across the mains. It is placed in the field of a coil which is in series with the house circuit. The current through the armature is proportional to the pressure at the house terminals, and the magnetic field in which it rotates is proportional to the current flowing into the house. Hence the driving torque is proportional to the product of these two, *i.e.*, to the watts expended. A large copper disc fixed on the spindle rotates in a magnetic field formed by permanent magnets, and thus the eddy currents induced in it produce a retarding torque proportional to the speed. Hence if there was no friction the number of revolutions of the spindle would measure the watt hours, *i.e.*, the energy consumed. In order that this meter may start with a sufficiently small current, a starting coil is used which consists of a few turns of the shunt resistance wound similarly to the series coil. Even when no current is being taken by the house circuit there is therefore a torque on the armature which is a little more than counterbalanced by the frictional resistance. This meter will record either alternating or direct currents.

The Ferranti meter is an ampere-hour meter, and utilises the principle that mercury placed in a magnetic field will rotate when current enters at its centre and leaves at its circumference. This meter successfully reduces the frictional resistance, but has the drawback, in common with several other meters, that an overload, such as an accidental short circuit, will upset the calibration and render it untrustworthy.

The losses that take place in the shunt coils of energy meters—losses that are continually going on—are very important. As a rule, they may be anything between one and four watts in a Kilowatt meter. This loss is paid for, of course, by the company. If we remember that a watt is about 44¼ foot pounds of work per minute, it will be seen that this is serious. At full load in a good meter about 1 per cent. of the total power is being wasted in the series coil, and about ¼ per cent. in the shunt coil.

In testing a meter the following points have to be considered:—

1. Its accuracy at a twentieth, a half, and at full load;
2. Whether it will run on the shunt alone if vibrated slightly;
3. Watts lost in the shunt;
4. The drop of volts in the series coil at full load;
5. The insulation of the meter.

One of the great drawbacks to making a good meter is the difficulty of overcoming the frictional resistance of the bearings, &c. Using a starting coil is not a satisfactory way of getting over this difficulty, because if the meter be afterwards placed in a situation where it is subject to vibration from the street traction the traffic in the streets or machinery, then we may have the meter continually registering. This difficulty is got over in the Evershed meter and in the Stanley meter by means of a magnetic suspension. In the Evershed meter nearly all the weight of the spindle and armature is supported magnetically, and in the Stanley meter all the weight of the spindle and the aluminum disc is supported magnetically. How successful Mr. Evershed has been in eliminating friction will be seen by the fact that the moment of the frictional resistance in his meter is only about two dyne-centimetres which is less than the 100th part of the moment of the frictional resistance of the best-known types of meter. A turning force equal to the 30,000th part of an ounce acting at a leverage of 1 in. would be sufficient to turn round the spindle of an Evershed meter, and it has a very wide range and is extremely accurate. One recently tested showed no error greater than one-tenth per cent. from one-twentieth to full load. This shows that the principle of the Evershed meter is sound, and if it can be made cheaply enough it ought to have a great future before it.

OBITUARY.

MR. JOSEPH GODDARD.—We regret to have to record the death of a well-known provincial architect, Mr. Joseph Goddard, of Leicester, who died suddenly from hæmorrhage on the brain at his residence, the Manor House, Newton-Harcourt, near Leicester, on the 10th inst., in his sixty-first year. Mr. Goddard was articled to his father, Mr. Henry Goddard, in 1856, and commenced practise in partnership with him in 1862. His first works were the Westcote School, Alderman Newton School, and St. Mary School; all carried out between 1862 and 1865; and in 1875 he carried out one of the first Board Schools, in Syston-street, all in Leicester. In 1868 he won in competition the Memorial Clock Tower, erected the following year in the centre of Leicester. He was equally fortunate in his competition for the Leicestershire Bank, built between 1870 and 1872, and in consequence of its success was appointed architect to the company, building in the following years the branch banks of Hinckley, Swadlincote, Uppingham, Ashby-de-la-Zouch, Loughborough, Coalville, Nuneaton, Bedworth, and Wellingborough. In 1866 he was entrusted with the important restoration of the Parish Church at Church Langton. The restoration of many Leicestershire churches followed, including those of Evington, Ibstock, Thornton, Oadby, Whetstone, Kirby Bellars, Whitwick, Newbold, Glenfield, and others of less importance. He also designed the churches of St. John the Baptist, St. Barnabas, S. Hilda, and St. James (now in progress), all in Leicester. Of these the church of St. John is the most remarkable, with a wide nave and narrow aisles serving as the ambulatory, and a gallery over, thus being able to bring the whole width of nave and aisles into the upper part of the church. In 1876 he built the Leicestershire Club, and at later periods the Alliance Offices, Walker Memorial Hall, General News Room, and Messrs. Cook & Son's Memorial Buildings, all in Leicester. In the course of his career Mr. Goddard built and inhabited three houses of his own design; the last one, at Knighton Spinneys, near Leicester, not only being admirably planned, but in design and construction one of the best half-timbered houses in the revival of this type. A drawing of this was placed on the line in the Royal Academy Exhibition of 1888, and in 1889 gained a silver medal at the Paris International Exhibition. The erection of these houses for himself brought numerous commissions, in many cases from complete strangers, who were anxious to obtain similar residences, the most important being Broomleys, at Coalville, and others in and about Leicester, at Manchester, Barnes Green, and Stanmore. All Mr. Goddard's earlier works were in the type of the Gothic revival of thirty to forty years ago, influenced by the works of the late William Burges and A. W. Godwin, and with respect to the former he followed in his wake by designing all his own furniture, finding it impossible otherwise to obtain examples which would be in accordance with the style of the houses he was building. Mr. Goddard became a Fellow of the Institute of Architects in 1871, and about three years ago was appointed Justice of the Peace. Mr. Goddard acquired from his father a taste for works of fine art, and on his death in 1868 he succeeded to a small but interesting collection, to which he has largely added. It was probably this taste which led him to assist in the formation of an art gallery in Leicester, which was one of the first started in the Provinces, and now forms one of the best collections.

MR. WALTER HANSTOCK.—We have also to announce the death, on the 6th instant, at Harrogate, in his 58th year, of Mr. Walter Hanstock, who, we understand, was the sole surviving partner of the firm of Messrs. W. Hanstock & Son, of Oxford-place, Leeds, and Branch-road, Batley. Mr. Hanstock gained the second premium, upon the award of Mr. Emerson as assessor, for his designs (of which the estimated cost amounted to 55,000*l.*) in the Leeds Market Hall competition of September last year. For the Corporation of Leeds he planned and designed the new Municipal Meat Market and Slaughter-houses, New York-street, opened on July 24, 1899, at a cost (to include the abattoirs) of about 30,000*l.*; additions to the Public Baths in Cookridge-street; the Public Baths in Joseph-street, Hunslet, 12,000*l.* (1898); Union-street Baths (1894-5); Kirkstall-road Baths; Holbeck-lane Baths (1897, cost about 8,500*l.*); and the Meanwood-road Baths, at a cost of 13,000*l.*, including 3,000*l.* for the site (1898). Amongst other architectural works recently carried out by him we may mention the Public Baths for the Selby Urban District Council; the laboratory at the Grammar School, Carlinghow, near Batley; the Public Baths, Batley (1893); and the Methodist Free Church at Armley, Yorkshire. A few months ago Mr. Hanstock was appointed architect to the Batley Corporation to prepare designs for the proposed Town Hall and municipal buildings (26,850*l.*), police-station and police-court (4,650*l.*), and an improvement of the public market (4,500*l.*), the estimated costs amounting to a total of 36,000*l.*

GENERAL BUILDING NEWS.

METHODIST CHURCH, RANMOOR, SHEFFIELD.—The foundation-stone of a Methodist church at the corner of Fulwood-road and Nethergreen-road, Ranmoor, was laid on the 10th inst. Mr. C. J. Innocent is the architect, and the contractors are Messrs. D. O'Neill & Son.

MISSION CHURCH, CHURCHILL, BRISTOL.—A mission church has been built near Stock-lane, in the parish of Churchill, near Bristol. The church consists of nave, chancel, vestry and porch, and is built of Ham Hill stone with a roof of red Broseley tiles. Messrs. Samson & Cottam, of Taunton and Bridgwater, were the architects, and Mr. T. Stockham, of Bridgwater, was the contractor.

ST. MATTHEW'S MISSION CHURCH, STRATFORD, LONDON.—The dedication service of this building was held on Friday, the 12th inst. A simple treatment of the early period of Gothic architecture has been adopted. The main gable of the church is flanked on either side by bold pilasters, one terminated with gabled canopy, the other being carried up as an open bell turret, terminating in a spirelet carried on four dwarf stone columns with carved caps. The spirelet is covered with oak shingles, and finished with a wrought-iron weather vane. A five-light centre-traceried window forms a feature in the front gable. A narthex containing two main entrances relieves the front elevation. The chancel arch is of Bath stone, carried on columns of the same material. The roof is of open timber hammer-beam construction with boarded ceiling, and the timber is stained dark walnut. The vestry is arranged on one side of the chancel, and class-rooms, kitchen, and other accommodation are placed in the basement. The building has been erected from designs selected in competition submitted by Messrs. George Baines & Reginald Palmer Baines, architects, of Clement's Inn, Strand. The builders were Messrs. Battley, Sons, & Holness, of London.

RESTORATION OF PARISH CHURCH, WATLINGTON.—This building, erected about the year 1300, and which was in a very dilapidated condition, has now been thoroughly restored, under the direction of the diocesan surveyor, Mr. A. J. Lacey, architect, of Norwich. During the execution of the work a piscina and two aumbries in the north wall of the chancel were discovered. They are believed to have belonged to a small chapel which existed there. Messrs. Bardell Bros., of Lynn, were the contractors, and the re-glazing was done by Mr. Thos. Horth, of Norwich.

ST. NICHOLAS MISSION CHURCH, BLACKWALL.—This church was consecrated a few days since. It stands in a district which has been formed on areas cleared for the formation of the Blackwall Tunnel, near one of the staircase entrances to the tunnel. Attached to the church are a recreation-room, kitchen, and committee-room. The building is of red bricks inside and out, the arches of openings almost entirely semi-circles, the covering of grey-green Westmoreland slates. There are six bays, and at the east end is an apse, covered with a semi-dome. The church is floored with Duffy's wood blocks, the windows are glazed with muffled glass, there are ventilators, with shields to prevent draughts, the heating is by hot water, and there is electric lighting. The attached buildings are distinguished from the church by differences of colour and treatment. Messrs. J. W. Falkener & Sons, of Ossory-road, Old Kent-road, have carried out the building work. It has been necessary to carry down large piers of brickwork in cement as far as the bottom of the lowest sewer, and to carry the walls over the sewers on steel girders. Messrs. J. & S. Flint Clarkson were the architects, and Mr. Hutcheson has acted as clerk of works.

THE LONDON SCHOOL OF MEDICINE FOR WOMEN.—The alterations and additions that have been carried out comprise the block having a frontage to Hunter-street, and containing residential rooms for seventeen students, and the science laboratories on the return frontage in Handel (formerly Henrietta) street, planned and designed by Mr. J. M. Brydon. To make room for the new buildings the retired cottage, or lodge, known as the "Pavilion," has been removed.

ENTRANCE, NO. 126, GREAT PORTLAND-STREET.—This house has recently been rebuilt for the school managers of All Souls, Langham-place. The ground floor is used as the entry to the infant schools in the rear, the upper story being used as a teachers'

and clergy residence. The ground floor has been treated by the architect, Mr. Beresford Pite, in an effective and characteristic manner, with two piers and carved brackets in Monk's Park stone, and a solidly designed iron railing in front of the central window, the entrances to school and residence being on each side. The iron girders carrying the upper front are exposed, and treated as a part of the architectural design.

Wesleyan Sunday School Buildings, North Ormesby, Yorkshire.—New Wesleyan Sunday school buildings were opened at North Ormesby on the 10th inst. The site has frontages to Derwent and Jubilee streets. The buildings comprise a central hall, 57 ft. by 30 ft. 6 in., an infants' schoolroom, 33 ft. by 16 ft. 4 in., six classrooms, a church parlour, vestry, kitchen, &c. The floor throughout is of wood blocks. Mr. Robert Moore, of Middlesbrough, was the architect and Messrs. Allison Bros., of the same place, were the contractors.

Laundry and Carpet-beating Works, Sheffield.—New premises for the Pitsmoor Laundry and Carpet-beating Company, Limited, have been erected in the Woodfold, off Woodside-lane, Pitsmoor, Sheffield. The architect was Mr. E. Winder, of Sheffield, and Messrs. Eshelby & Sons were the contractors.

Almshouses, Dewsbury, Yorkshire.—The Fletcher Homes, six almshouses which have been built on the north side of Dewsbury Public Park, were opened on the 10th inst. The buildings are of stone from the Woodhead quarries. Mr. F. W. Ridgway was the architect.

New Hotel, South Shore, Blackpool.—The building of the Savoy Hotel, South Shore, on the site of the Old Britannia, is estimated to cost about 30,000*l.* The edifice will be in the Italian Renaissance style, and will have a commanding elevation to the sea, with frontages to Shaw-road, Britannia-place, and Bolton-street. On the ground floor there will be an entrance-hall, with central lounge, smoking and billiard room, coffee-room, and a dining-room 82 ft. long. Hydraulic lift, lavatories, &c., are to be placed on each floor. The basement is to be entirely occupied by large kitchen and servants' offices, bottling stores, wine and beer stores, &c. First, second, third, and fourth floors are to be fitted up with drawing, sitting, and bedrooms, in all ninety-eight bed and sitting-rooms. The hotel has been designed by Messrs. Garlick & Sykes, architects; and Mr. William Eaves, of North Shore, Blackpool, is the building contractor.

Public Hall and Winter Garden, Springburn, Glasgow.—The memorial stone of a public hall about to be erected in Springburn was recently laid, and the formal opening of the Reid Winter Garden took place at the same time. The public Hall is situated in Keppochhill-road, at the corner of Millerbank-street, and almost directly opposite another range of public buildings occupied by the Fire Brigade and Tramway Departments. The estimated cost is about 12,000*l.*, and the edifice is being erected in accordance with plans by Mr. W. B. Whittie, formerly assistant in the office of Mr. A. B. M'Donald, the City Engineer. The main hall is 77 ft. in length by 50 ft. in width, and is seated for the accommodation of fully 1,200 persons. The Winter Garden occupies an appropriate site on the southern portion of Springburn Park, a short distance to the north of Broomfield-road. It has been erected at a cost of 10,000*l.*, through the generosity of the family of the late Lord Dean of Guild Reid, whose gifts to the city, it will be recalled, include a numerous and valuable collection of paintings. The structure, which has an internal area of 150 ft. by 60 ft., is about 40 ft. in height, and was designed by Messrs. Simpson & Farmer, hot-house builders, with Mr. William Baird, of the Temple Ironworks. On each side of the main building is a range of plant houses.

Chapel School, Whiterigg, Lanarkshire.—This school was opened recently; it is situated on high ground on the road between Airdrie and Plains. It is constructed of rough freestone, taken from Fallahill Quarries, and is partly of Gothic and partly of Old English design. The length of the building is 106 ft., the breadth 45 ft., with an interior height of 20 ft. The entrances, two in number, are both situated on the side of the church farthest from the road. The interior of the building is divided off by folding doors. Three of the divisions only are used for school purposes, but for the Sunday services the full length of the building is utilised. For the children a cloak-room and lavatory are provided within the building. A wainscot of polished pine runs round the whole interior of the building for a height of about 6 ft. from the floor. The altar is the work of Mr. Hugh Murphy, of Glasgow. There is accommodation for 500 at Mass, and for 300 school children. Acetylene gas is to be the illuminant. The heating apparatus consists of hot steam in pipes which run round the interior of the whole building. The building was designed by the late Mr. Cowan, the diocesan architect.

Proposed Baths, Morley-street, Bradford.—The Baths Committee of the Bradford corporation are applying for the sanction of the Local Government Board for a loan of 40,000*l.* for the erection of baths in Morley-street. The plans provide a swimming bath nearly 120 ft. long by 40 ft. wide. The dressing-rooms would be in a separate apartment. In winter the swimming bath would be covered with a pine flooring, and the surrounding space would be converted into raised tiers. The apartment containing removable dressing-rooms would become a supper-room. The decorations uniformly would be such as to suit the purposes of a bath in summer and of a concert-hall or dancing-room in the winter. As a concert-hall, the building would yield sitting accommodation for nearly 1,300 persons. Mr. A. H. Tiltman, architect, of London, has prepared the sketch plans.

Primitive Methodist Institute and Sunday School Building, Burslem.—A Primitive Methodist Institute and Sunday-school building, in Church-street, Burslem, was opened on the 12th inst. The building is two storied. It contains two assembly rooms, fourteen class-rooms and kitchen. The rooms are separated by folding partitions, whereby seven class-rooms may be added to each central hall: giving two assembly rooms, one on each floor of about 60 ft. and 50 ft. In the centre of the front façade is the principal entrance and the main staircase leading to the boys' school above, whilst from the vestibule below access is gained right and left to the girls' and infants' school. The principal elevation, which has terra cotta dressings, faces Church-street. The building is warmed by open fireplaces supplemented by hot-water pipes. Mr. J. H. Broadhurst, of Burslem, was the contractor; Messrs. Ford and Slater were the architects.

Mission Church, Roundhay, Leeds.—The foundation stone of a mission church and parochial hall, at Roundhay, Leeds, has recently been laid. The building is designed to accommodate 250 people, and will be of stone. Its cost is estimated at 1,500*l.* Mr. Carby Hall is the architect.

SANITARY AND ENGINEERING NEWS.

Electric Fittings, Bridgewater House.—A number of leading manufacturers in England and France were recently invited to submit designs for electric fittings for Bridgewater House, London, the town residence of the Earl of Ellesmere. Considerably over a hundred designs were sent in, and those submitted by Messrs. Dynnison, Berlon Sillem & Co., of London and Liverpool, were selected. Massive circular dishes of cut glass, 24 in. in diameter, surmounted by metal coronas, form the principal part of each electrolier, and the supporters and crest of the Ellesmere family have been introduced throughout. The coronas, with their six crystal pendants surrounding the larger central cut glass dish, and carrying forty-five lights in all, are supported by chains and rings from metal crowns at the ceiling above. The state rooms will take sixteen of these electroliers.

Victoria Bridge, Perth, N.B.—The new bridge over the river Tay at Perth, was opened by Sir Robert Pullar, on Saturday, the 13th inst. The bridge has six piers formed with steel caissons sunk into the bed of the river to a depth of about 30 feet below the summer level of the river. The *Dundee Advertiser* states that at each side of the bridge the last six feet of excavation work was in hard clay, which proved very troublesome to the contractors owing to the water being inside of the cyclinders. Each cylinder was filled with cement concrete to the summer level of the river, and here the masonry of the piers commenced. After the girders were set the mason work in connexion with the pilasters was commenced, and carried up in two octagonal turrets in the Scotch Baronial style. There are four spans of girders, each 88 ft. long, and three cross girders bracing between the piers. On the top of the cross girders longitudinal piers parallel with the main girders are run from end to end, and are jack-arched. The pavement is of granolithic, while the road is laid with tar macadam. On each side of the road runs a parapet wall, and at the east abutment there is a flood arch 17 ft. wide; while between this and the Dundee-road is an access for the proprietor of the Rodney Lodge grounds. The cost of the whole is between 30,000*l.* and 40,000*l.* The contractors were:—Mason work, Messrs. Fraser & Morton, Perth; iron work, Arrol's Bridge and Roof Company. The engineer was Mr. F. Young (Messrs. Blyth and Westland); and the clerk of works, Mr. Webster.

Sewage Disposal, Glendale.—The Glendale Rural District Council at their last meeting approved and accepted the scheme of sewage disposal prepared by Mr. Harry W. Taylor, of Newcastle-on-Tyne and Birmingham. The sewage will be disposed of bacterially, the cost being about 1,750*l.*

FOREIGN.

France.—The new building for the Ecole des Arts et Métiers at Lille, commenced as long as twenty years ago, has just been opened. M. Batigny is the architect. It is in French Renaissance style, and the principal façade is decorated with pediment sculpture by M. Cordonnier, representing "France encouraging Art and Industry," and with separate statues symbolising Art, Science, Commerce, and Industry, by MM. Fagel, Mabille, Gascq and Laoust. A spacious courtyard separates the school proper from the shops for metal work, carpentry, and weaving.——M. Gervex has been commissioned to paint the commemorative picture of the Mayors' banquet, in place of the Roll, who has declined.——M. Alfred Lenoir, the sculptor, has just completed the model for a monument to M. César Franck, the composer, which is of rather unusual type. It consists of a representation of a portion of a church in the mediæval style, in which the composer is represented seated at an organ, and inspired by a female figure representing "Musique Sacrée," who leans forward towards him from the opening of a pointed arch. The architectural portion is by M. Hannotin.——A monument to Lenepveu, the painter, has been completed at Angers. It consists of a bust by M. Injalbert, on a pedestal bearing a bas-relief by M. Louis Noel representing Painting, with the Villa Medici and the Institute of France as a background.——The new church at Lourdes is in active progress. It is in a pure Romanesque style, and is more than 200 ft. long and about 90 ft. in extreme width. It is expected that the building will be completed in a year.——M. Chandéze has been appointed curator of the Conservatoire des Arts et Metiers in place of Col. Laussedat, who has resigned.——The Paris Committee of "Habitations à bon marché" has instituted a competition, to take place on November 30, in which prizes will be awarded to the best plans of dwellings of the above-named class built since 1896.——The jury of the competition for a hospital at Honfleur has awarded premiums to M. Rueil and M. Brieu, as of equal merit.——The decease is announced of M. Guinet, architect, of Nancy, at the age of thirty-nine.

Queensland.—In the recent competition for a new General Post Office to be erected in Brisbane, the first premium was awarded to the design by Mr. John Barr. In an article in the Brisbane *Telegraph* it is stated that the aim in this design has been to keep each department distinct, with good lighting, cross ventilation, and proper aspects. Building operations will be commenced by the removal of all premises on that portion of the site between the two lanes and Elizabeth-street. This part of the building will be completed first, and a new lane formed, giving uninterrupted communication between Queen and Elizabeth streets. The public hall of telegraph and money-order offices, and sale of stamps, would be placed temporarily in the clerks' office, with entrance from the arcade. The remaining portion of the building would then be built, completing the contract. The style is free classic. The exterior walls are to be built of local sandstone returning round two pavilions, the remainder of brick with stone dressing. All partition walls are to be of terra-cotta lumber built in cement, and Monier fireproof flooring throughout. The public hall floor is to be covered with large marble mosaic; the mail branch floor covered with wood-blocks; basement and balcony floors with asphalt. The ceilings to the administrative branch to be plaster, the remaining ceilings small corrugated iron. The heating is by electrical radiators in the rooms, and lighting by electrical power supplied from dynamos in the basement. Ventilating trunks are to be carried over the corridor ceilings with inlets to the rooms, the trunks being taken to the basement floor level and into the chimney-shaft, which will act as an extract ventilator. The estimated cost is 150,653*l.*

India.—A licence has been granted to the Calcutta Electric Supply Company to supply electricity to the added area of Calcutta, including the suburbs of Alipore and Ballygunge.——The Bombay-Baroda and Central India Railway Company have decided to practically reconstruct their metre gauge lines at Delhi to suit the convenience of the standard gauge lines.——The Ootacamund Municipal Council have decided to ask the Madras Sanitary Board to furnish them with type designs for model native houses to be erected by the Council.——Analyses of Bombay water during the month of September show that the heavy rains have purified the water in the lakes, and all the waters may at the present season be classed as fairly good waters.——The condition of the fine mosaic pavement in the Lahore Museum is said to be very unsatisfactory. The original materials with which it was laid do not appear to have been good.——The Government of India have approved of the site selected for the new European Hospital to be constructed at Simla, and have authorised the local government to make a free grant of the land to the hospital committee.——Subject to defensive requirements being complied with, the Government of India has approved the construction by the Provincial Irrigation Department of the canal connecting the Madras harbour with the Cooum.

MISCELLANEOUS.

Memorial Window, Botus Fleming Church, near Plymouth.—A stained glass window has been placed in Botus Fleming church, in memory of General Sir W. Penn Symons. The subject of the window is "Christ and the Centurion." Underneath the window is a brass plate bearing an inscription. The work was designed and executed by Mr. W. G. Taylor, of London.

Glasgow Architectural Craftsmen's Society.—The opening meeting for the session was held on

the 13th inst., when Mr. Alex. Davie delivered his Presidential address. In his opening remarks he stated that he proposed speaking on a subject interesting to all members of the Society, namely, "The Carrying-out of Building Contracts." Speaking of the architect's share of this, he mentioned his great responsibilities and the necessity of his being able to prepare plans to suit his client's requirements, to design with taste, and to use good construction. Valuable hints were then given in regard to the preparing of probable costs and schedules. Suggestions as to conducting their work were made to contractors, and the paper concluded by asking the members to remember that the object of the Society was the mutual improvement of its members in all matters relating to architecture and building, and to help to attain this end by giving their individual experiences as craftsmen in the various discussions during the session.

Memorial Tablet to Members of the C.I.V.—It has been decided to erect a Bronze Memorial Tablet in the Parish Church of each member of the above regiment who has fallen in the South African campaign, subject to the approval of the incumbents. The Lord Mayor (Sir Alfred Newton) has commissioned Mr. Frederick Wheeler, architect, to prepare the design. We learn this has been approved, and that the work is now being carried out by the Coalbrookdale Company, of Queen Victoria-street, E.C. Mr. Wheeler, we may mention, is an old member of the 20th Middlesex (Artists).

The Holland Fine Art Gallery.—This gallery has been removed from 235A, Regent-street to 14, Grafton-street, Bond-street, W. An exhibition of works by modern Dutch masters will be opened there on October 24.

A Brickworks in the Market.—At the Mart Tokenhouse-yard, on Wednesday, the 9th inst., Messrs. Willis & Crouch offered for sale by auction the freehold property known as the Lower Morden Brickworks (formerly the Wimbledon District Brick, Tile, and Pottery Works), near Raynes Park and Worcester Park stations. It was explained that the area comprised 27 a. 3 r. 39 p. of excellent mild earth up to 30 ft. thick, suitable for manufacture into all kinds of brickyard goods. The present trade, it was added, was principally in London stocks, of which the sales for cash with order had averaged 3,500,000 yearly for some years past. Messrs. Trendell Bros., the proprietors, were dissolving partnership, and were disposing of their works as a going concern. Wimbledon, Kingston, Surbiton, Croydon, Mitcham, Sutton, Ewell, and other towns and neighbourhoods were all within easy reach by good roads; plenty of water was available, and there was no difficulty in procuring both chalk and breeze. The buildings comprised two five-roomed brick-built cottages, an office, a large drying-shed, shaft, tool-shed, and numerous timber-built sheds. The plant, comprising five pug mills (driven by steam), and all necessary utensils and accessories would have to be taken by the purchaser at a valuation in the usual way. There was only a small attendance in the auction-room. Bidding commenced at 1,500*l.* and went up to 1,600*l.*, beyond which the occupant of the rostrum (Mr. Crouch) could elicit no advance, and he declared it not sold, but bought in by the vendor at 3,000*l.*

Obsolete Drainage, Sheffield.—The *Sheffield Independent* states that at the Sheffield Town Hall on the 9th inst. a Local Government Board inquiry was held to hear an appeal entered by Mr. Robert Styring, solicitor, of Sheffield, against charges made upon him by the Sheffield Corporation in respect of two houses, Nos. 193 and 195, Rockingham-street. The drainage of these houses was effected until recently by an open channel across the pavement. The Corporation have substituted a proper closed drain, connected with their sewer, and charged the owner of the property with the cost, under the provisions of Section 23 of the Public Health Act of 1870. The contention of the appellant was that the improvement was chargeable to the public funds, and not to the owner of the property. The Town Clerk remarked that to a great extent this was a test case. In the course of the evidence Dr. Robertson, Medical Officer of Health for the city, said that in November, 1898, his attention was called to the condition of Rockingham-street. In consequence of that he made an inspection, and took notes of a number of defective channels crossing the pavement. He presented a Report to the Health Committee, in which he said that the unhealthiness was due to slop water stagnating upon the footpaths, and were this remedied the repairs necessary to the footpaths need not be very extensive in order to make the street reasonably healthy. The houses, Nos. 193 and 195 were made a note of as amongst those which had defective channels which ought to be dealt with. Dr. Robertson went on to say: "I think the question of surface drainage in a town like Sheffield is one of the things which give rise to the enormous typhoid and diarrhœa mortality we have here. The discharge of sewage into more or less imperfect channels, and its percolation into the ground-soil, constitute the danger."

Institution of Junior Engineers. — Sir Lowthian Bell, Bart., F.R.S., has been elected President of this Institution, in succession to the Hon. G. A. Parsons, the retiring President.

CAPITAL AND LABOUR.

Employment in the Building Trades During September. — The *Labour Gazette* reports that employment in the building trades has remained good in most branches. The percentage of unemployed union members among carpenters and plumbers at the end of the month was 2·1, compared with 1·8 in July and August. The percentage for September, 1899, was 1·3. In London the trades continue well employed in most branches. Returns from 184 branches of eight unions paying unemployed benefit, with a membership of 13,604, show that 217 (or 1·6 per cent.) were unemployed, compared with 1·3 in August, and 0·5 per cent. in September, 1899. The carpenters and joiners, stonemasons and stonecarvers, describe employment as fair; the bricklayers, painters and decorators, and plumbers, as moderate; the plasterers as bad. Five disputes commenced during September, and affected 290 workpeople, directly or indirectly. All the disputes were in England. Only one was in reference to wages. It affected thirty-three plumbers at Stockton-on-Tees, who required an advance from 8½d. to 9½d. per hour. No settlement has been reported. Of the four other disputes, one had reference to an importation of worked stone from alleged lower paid localities; another was a demarcation dispute between bricklayers and stonemasons, followed by a general lock-out; the third was a strike against an introduction of piecework; and the last had reference to cement floors being laid by a concrete worker. With regard to the dispute as to importation of worked stone, it is stated that "men found work elsewhere; shop closed to union men." The dispute affected only twelve workmen. The result of the demarcation dispute was that the work was awarded by the arbitrator to the bricklayers. The dispute was at Barrow-in-Furness. Of the two remaining disputes no settlements are reported.

LEGAL.

A QUESTION OF LIABILITY.

Sitting at the Lambeth Police-court recently Mr. Horace Smith heard a summons taken out by the London County Council against Mr. Frederick Beckwith, of St. Luke's-road, Clapham, as the owner of a house in Hemberton-road, for the recovery of the sum of 2*l.* 5s. 3d., being expenses incurred by the Council in respect of the survey of the premises in question as a "dangerous structure." Mr. Beckwith disputed his liability. Mr. Norman Bevan, from the solicitor's department of the Council, said the house in Hemberton-road belonging to the defendant was certified to be dangerous by the District Surveyor, who ordered the owner to take down a defective ceiling and reinstate a wooden cross-runner carrying the wall above should it have been rotted through the percolation of water from above. The defendant did not carry out the requirements of the notice and the Council issued a summons at this court. Then it appeared that the defendant had repaired the defective plaster, and had barred the bressummer, with the result that it was found that it was not dangerous. Whether the bressummer was dangerous or not was beside the point, because the plaster was dangerous, although the building was not dangerous to the extent expected by the Surveyor. The summons was withdrawn, and now the defendant thought that he ought not to pay the expenses of the Surveyor. The Act, however, was clear on the point, and the fact that the original summons was withdrawn did not preclude the Council from recovering their expenses. In many cases the owner did the necessary work without a summons being issued at all. Mr. Horace Smith said he did not think there was any doubt about the case. Defendant: It was not a dangerous structure to start with. Mr. Horace Smith remarked that it was dangerous to the extent of the plaster, and said he thought the Council were entitled to recover. Defendant: I do not see why they should be if it was not dangerous. Mr. Henry Parsons, District Surveyor for the Southern Division of Lambeth and part of Camberwell, said he surveyed the house in question and gave a certificate to the effect that the building was dangerous so far as regards the ceiling, part of which had fallen, and he also suggested, he having seen that there was a great leakage in the ceiling, that the wood bressummer should be reinstated should it be found to be rotten through the percolation of water above. As a matter of fact the bressummer upon examination was found to be perfectly sound.—Defendant: How much plaster do you say was cracked?—Witness: Really I cannot say. The defendant said there were only two yards of plaster.—Mr. Horace Smith made an order requiring the defendant to pay the Council the amount claimed, together with 13s. 6d. costs.

BUILDING PROSECUTION, BURSLEM.

At Tunstall Stipendiary Court, on the 11th inst., the Stipendiary gave judgment in the case of Charles Henry Holmes, builder, of Surrey-road, Crewe, who was summoned for breaches of the by-laws in respect to certain houses defendant was erecting in Newcastle-street, Burslem. There were three offences alleged, namely (1) that walls were not properly bonded, (2) that flues were not properly plastered or pargetted, and (3) that the joists were not placed 4½ in. from the centre of the wall. With regard to the first two, the Stipendiary, who had inspected the houses, said the by-laws had been absolutely broken. There was nothing true in the suggestion for the defence that the angle walls had been bonded; even with the aid of a stick it seemed to him they could be pushed one from the other. Then if the plastering, or pargetting, carried out was proper plastering they might just as well strike out the by-law altogether. With regard to the third offence, the by-law said the joists must be placed 4½ in. from the centre of the wall, but the Corporation allowed defendant to build a 9-in. wall, and if the by-law was insisted upon the joists did not rest on anything. Referring again to the established breaches of the by-laws, the Stipendiary described the work as of the jerriest character he had seen, and disgraceful in any kind of construction. He inflicted a fine of 40s. and costs in each of the two cases, and adjourned the question of a continuing offence to see if the work would be carried out. The Stipendiary asked why the Corporation did not have their by-law with respect to the joists altered, and Mr. Ellis said the Local Government Board would not allow them to alter it. They would not have prosecuted, however, if defendant had not placed the joists end to end, but had placed them alternately.—*Staffordshire Sentinel.*

THE FENCING OF CIRCULAR SAWS.

At the Rochdale Police-court, on the 10th inst., Schofield and Jones, joiners and builders, Duke-street, Rochdale, were charged with neglecting to fence a circular-saw. Mr. Dodgson, Factory Inspector, conducted the prosecution, and stated that on August 30 James Pilling was injured by the defendants' circular-saw, and that his right hand had to be amputated. On July 5 he visited the manufactory in consequence of an accident through an unfenced flywheel, and then he noticed that the saw was still unfenced, and he notified the firm of the defect. On July 13 he saw Mr. Jones and noticed that the saw was still unfenced, and told Mr. Jones that if an accident occurred he should proceed against him for a penalty of 100*l.* On August 30, the accident occurred to James Pilling. On September 14 he saw again that no guard had been provided. Pilling was a married man, with a family, and had only been employed by the firm thirty minutes when the accident occurred. After Pilling had given evidence, Mr. Thompson, who conducted the defence, called John Schofield, a member of the firm, who said, as a practical man, that he never saw a guard used when sawing window-sills. Christopher Jones corroborated this evidence. Herbert Crabb, the foreman, stated that he had worked this machine without a guard for the last four years, and had not had an accident. George Cockrill, manager of Messrs. Grandidge's timber works, stated that they had eight machines, and they were provided with guards, but the workmen would not use them. The magistrates imposed a fine of 5*l.* and costs.—*Manchester Courier.*

CLAIM FOR BUILDING MATERIALS: DISPUTED LIABILITY.

In the Westminster County-court on Monday, his Honour Judge Lumley Smith, Q.C., and a jury, had before them the case of Bolding & Sons *v.* the Finchley School Board, in which the plaintiffs, a firm of metal and hot water apparatus dealers, carrying on business at Davies-street, Oxford-street, sued the defendant board to recover the sum of 48*l.* in respect of sheet-lead, brass, and hot water fittings supplied to the order of a man named Holloway, in his capacity of director of works.

The defence was that Holloway had no authority to give the orders, and that the plaintiffs knew perfectly well that he had been removed from his position.

Mr. Christopher C. Hart was called and said he was the managing director of the plaintiff company, and was introduced to Holloway by a Mr. Sayers who was the chairman of the Finance Committee of the board, and who told him that he could supply goods to Holloway's order. That took place in 1898, and from that time forward Holloway was looked upon as the accredited agent of the board, but when the present account was sent in they repudiated their liability and refused to pay.

The defence was that prior to the supply of the goods in question the plaintiffs had been instructed not to supply goods to anybody without the authority of the architect. It was further contended that the plaintiffs had made personal application to Holloway for payment, and that he had promised to settle the matter with them, but he committed suicide on the very day upon which he promised payment.

After hearing the whole of the evidence his Honour withdrew the case from the jury, and gave judgment for the defendants, with costs, on the ground that plaintiffs ought to have demanded an officially sealed order from the Board before supplying the goods.

RECENT PATENTS:

ABSTRACTS OF PATENTED INVENTIONS.

12,332.—Floors and Pavements: *C. Spighi.*—A grooved or perforated wooden backing-block is secured with hot asphalt or mastic to a wearing-face of fine wood, whose edges project beyond the asphalt; the composite blocks are laid in cement, asphalt, &c., upon boards that are fastened to the joists of the floor, passage, and so on.

12,334.—Extinction of Fire: *W. H. Douglas.*—In order that acid and alkali may be readily mixed the extincteur is inverted, whereupon the acid escapes through the opened valve or cover of its container, and through perforations to the alkali that is admitted through openings between the acid bottle and its supporting flange; in another form vent-holes are cut in the sides of the acid bottle.

12,353.—Electrical Conductor Conduits: *E. Jones and F. A. Pocklington.*—The lengths having a partial pipe-section are closed with lids of tile, and they have either spigot-and-socket joints or butt joints with separate sleeves, an insulating material is filled in, the cables resting upon studs or bridge-pieces; the service boxes are divided with vertical partitions, which serve to keep the wires apart from one another, and chambers are provided around the service and other fittings by means of junction boxes that are set over the conduits.

12,365.—Ball-and-float Valves: *J. H. Harrison.*—A ball valve and a disc valve are arranged within the casing of a ball-and-float valve. One end of the spindle that carries the disc valve engages with the float's arm, whilst its other end raises the ball valve from its seating. A cup that contains a washer forms the disc valve which operates against a removable seat. Nuts that work upon an adjustable spindle hold the bent and free end of the float arm to the ball. The principle of the invention may be rendered applicable to a water tap by screwing the disc valve's spindle and fitting it with a handle.

12,413.—Appliance for Flushing and other Taps: *S. A. Bhise.*—For the automatical closing of a flushing tap, a plug valve, which is joined with hanging rods to the cistern containing a float, is fitted to the passage that joins the service and discharge pipes, the valve remains shut whilst under normal conditions the cistern and float remain at the bottom of the containing chamber, but the flush is started at the rising of the cistern, together with the plug valve, when the working-lever is pressed downwards; a catch upon the pivotted arm that carries the float engages with a projection so that it may sustain the cistern when the latter is lifted, whereupon water will flow into the cistern through a by-pass (which can be regulated) until the rising float frees the catch in order that the cistern's fall may again close the valve. When the cistern sinks to the bottom of the container it discharges its contents through a pipe into the flushing-pipe as a valve is pressed upwards by the contact. The main plug valve may be either after the hinged disc kind or conical in shape, to be turned about its axis with a toothed quadrant-rack. Various modifications of the mechanism are specified.

12,453.—Tile-moulding: *E. Hodgkinson.*—For making ridge, hip, coping, valley, or other angle-tiles the pugged clay is forced through rollers, which consist of segments V-shaped in cross-section that are bolted on to plain rollers, the stream of clay as it is pressed out being cut into lengths with a knife or blade which is set in operation by the mechanism specified in No. 28,168 of 1897. The plain tiles can be shaped in the ordinary manner, or caps, ridges, or rolls can be affixed to the plain angle-tiles. For making ridge tiles that have central ribs a grooved roller is to be employed.

12,458.—Automatical and Intermittent Water-discharge: *J. Murray.*—Though the apparatus more particularly relates to the discharge of sewage filters, it is stated to be applicable for flushing trough closets, drains, &c. Joined to each filter bed are two chambers, one of which communicates through a pipe with the filter, and the other communicates with the former by means of a valve. When the filter has been filled, the liquid passes into the second chamber until a siphon is started so as to start another siphon which discharges the filter, whilst the valve controls the time during which the filter will be full.

12,467.—Cranes: *J. Rühling.*—Builders' materials are raised by means of a crane, whose base is made fast to the structure with clamps; the crane is made so that its head can be turned around an axis upon the vertical support, and ball bearings may be adopted for the winch's axle.

12,581.—An Odometer: *H. A. L. Chaix.*—A wheel nave or axle turns a chain wheel which operates upon level wheels and a friction disc; a friction wheel imparts motion to the gearing for an index hand, and that wheel is adjustable upon the friction disc's face accordingly with the diameter of the vehicle's wheel. In the register, which may be placed some distance apart, are bellows into which air is forced with an india-rubber ball, which is compressed by the action of a cam rocking a spring cradle; a pawl upon the top of the bellows moves the first wheel of a gear after the "Geneva" kind. In order to set the register at zero, squared spindles, to be turned with a key, are joined rigidly to the dials, and the gear wheels work together through their contact alone.

12,638.—Pipes and Joints for Drains, Sewers, &c.: *H. J. Weaver.*—For joining two main pipes after they have been fixed or laid is contrived an insertion-pipe, which is composed of a pipe, an extended socket pipe fashioned with a slot, and a ring, or making-up piece, which will fit within the slot in the socket pipe, and there are projections upon the insertion and socket parts. The three parts together may be as long as a common pipe, and be made of iron, terra-cotta, &c.

12,640.—Fencing-posts or Standards: *R. S. Moncaster.*—For making hollow standards or posts, the inventor bends sheet-metal strips so that their edges, being left apart, shall form slits; in line with the slits he makes holes in the standards, into which are fitted screw-hooks for the wires, or strands, or wire nettings, the latter being secured with nuts; the slits will also take T-headed bolts, with which earth-plates can be fastened on to the standards.

12,652.—Self-closing and Lift Valves: *J. Hurrell and G. Sturgeon.*—The two parts which constitute the casing of a self-closing water-tap are fastened together and are provided with a washer, which answers the purpose of a seat for a spring-pressed valve; in the screwed plug which serves for the opening of the valve is a hole into which the valve spindle is fitted, or a short upper spindle can be attached to the plug.

12,662.—Butt and Flange Joints: *C. Taylor.*—A jointing for soil and waste pipes is formed between the soil pipe and the leaden pipe that passes from the closet by slipping a flange over the end of the leaden pipe and splaying out its end so as to make a packing washer between the flanges. For the smaller connecting pipes the leaden washer should be soldered on; by these means a jointing may be effected at any angle.

12,663-4.—Kilns for Burning Lime, Cement, &c.: *F. C. Timm.*—In the case of shaft kilns or furnaces the walls are made thin and around them is built up a casing that comprises an entire cylindrical surface consisting of several sections, laid the one above the other, or of separated rings, so that the furnace's walls are sustained by either corrugated plates, half-tubes, whole tubes, or radial wings to be inserted at different places within the casing and outside the built-up sections. For rotary furnaces heated with gaseous fuel, the "baking-on" of goods to the interior is obviated by forming the inner tube of metal without any lining, or with but a thin lining only, and providing for the circulation of air within the annular space between the tube and the outer casing which turns with it. Freedom of expansion is ensured by loosely joining the casing to the tube by means of radial wings that are fastened on to driving and supporting rings, and, after passing through spaces in the casing, engage freely with projections upon the tube; at the ends of the tube and casing are flanges that press against cylindrical projections on the fixed end chambers.

12,690.—A Circular-saw Guard: *R. W. Tayler and J. Tayler.*—An adjustable guard for differently-sized saws consists of a pillar which carries a radial bar. The bar supports two front and back guard-plates which are attached to toothed segments, the back plate being adjusted lengthwise, and the segments are pivotted on to a sliding plate. A sliding-rack provides for the setting of the guard-plates at any angle; another guard-plate, mounted at the end of a lever and held up by a counter weight, is placed beneath the back guard-plate and is pressed down by the wood which drives the lever's end forward, the wood being then returned to its normal position by the action of the balance weight.

12,712.—A Water-waste Preventer: *C. H. Woodhouse, T. W. Woodhouse, and T. W. Cook.*—A bell is kept in its place within a well by means of two projecting lugs that engage with two recesses that are fashioned in the bell's flange. The bell is prevented from touching the bottom of the well with india-rubber buffers set in keyhole-shaped slots. Upon opposite sides of the tank are recesses which take the axle of the rocking lever.

12,792.—An Apparatus for Windows: *H. Beyer.*—Upon the sides of the sliding sash or frame is a rack that will gear with pinions that turn upon rubber tubes mounted upon grooved bosses. The bosses are affixed to squared pins, which pass through the sides of metal boxes in recesses cut in the frame. The sash or frame will be held in any required position by means of the friction set up between the pinions and the tubes. For the tubes may be substituted solid cushions, and within the tubes may be put solid cores or helical springs. Any shaking by the sash in the frame will be obviated by adding pads or shoes of india-rubber to the ends of the sash stiles.

12,836.—Process of Moulding Building Blocks, &c.: *C. Schneider.*—For moulding blocks of fire-proof materials, artificial stone, Dinard or magnesia stone, and for the walls of smelting-furnaces, the mould is formed of a bed which has spring-controlled sides; over the mass is passed a roller with a pressure that increases gradually until all air has been forced out and a high degree of density has been obtained. A moveable mould and a fixed roller can be employed, or the blocks can be drawn between rollers in pairs. The apparatus is also intended for use in the manufacture of electrical-light carbons, carbon anodes for electrolytical processes, and kindred goods.

12,871.—Cements for Building Purposes: *W. Borgolte.*—The cements which are especially intended for taking oil-colours and similar coatings are made by mixing ground limestone and ground clay with small quantities of tar, naphtha, paraffin, coal, fat, sawdust, &c., separately burned without the access of air; the admixture is pulverised, and after the addition of oil, coal, &c., is again similarly burned, when it is broken and ground. For a glazed cement clay-marl and alumina should be incorporated with the compound, together with minerals, either unburned or burned with hydrocarbons.

MEETINGS.

Friday, October 19.

Architectural Association.—Annual Conversazione, King's Hall, Holborn Restaurant. 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Dr. H. R. Kenwood on "Elementary Statistics." 8 p.m.

Institution of Mechanical Engineers.—Mr. Bryan Donkin on "An Improved Glass Revealer for Studying Condensation in Steam Engine Cylinders and Rendering the Effects Visible." 8 p.m.

Saturday, October 20.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection at Leyton Sewage and Destructor Works. 3 p.m.

Architectural Association of Ireland.—Visit to Royal Hospital, Kilmainham.

Tuesday, October 23.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.

Wednesday, October 24.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. Wright Clarke on "Sanitary Appliances." 8 p.m.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection and Demonstration in the Parish of St. George's, Hanover-square (number limited). 2 p.m.

Thursday, October 25.

Carpenters' Hall, London Wall (Lectures on Sanitary Building Construction).—Professor R. Elsey Smith, A.R.I.B.A., on "The Drainage of a Dwelling House." 7.30 p.m.

Friday, October 26.

Architectural Association.—Mr. Francis Bond, M.A., on "French and English Cathedrals." 7.30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. H. D. Searles Wood on "Building Materials." 8 p.m.

Institution of Junior Engineers.—Annual General Meeting at Westminster Palace Hotel. 8 p.m.

Saturday, October 27.

Sanitary Institute (Demonstrations for Sanitary Officers).—Inspection and Demonstration at Aylesbury Dairy Company's premises, St. Petersburgh-place, Bayswater. 3 p.m.

Institution of Junior Engineers.—Visit to Millbank Station of London Hydraulic Power Company. 3 p.m.

SOME RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

October 3.—By Cheatle & Hall (at Longdon).

Longdon, Staffs.—A copyhold farm, 12a. 0r. 29 p. £360
Five cottages, blacksmith's shop, and plot of garden land, c. 56
The Meeting House Field, 4 a. 1 r. 27 p., f. 65

October 4.—By Newbon, Edwards, & Shephard.

Islington.—23, Gibson-sq., u.t. 26 yrs., g.r. 9l., r. 48l. 365
Barnsbury.—47, Crossley-st., u.t. 50 yrs., g.r. 6l. 10s., r. 38l. 330
Holloway.—14, Freegrove-rd., u.t. 56 yrs., g.r. 6l. r. 42l. 55
38, Grove-rd., u.t. 48 yrs., g.r. 8l., r. 40l. 335
29, Beversbrook-rd., u.t. 67 yrs., g.r. 7l., e.r. 48l. 335
15, Alexander-rd.. u.t. 57 yrs., g.r. 6l., r. 36l. 330
8, Landseer-rd., u.t. 57 yrs., g.r. 6l., r. 38l. 410

By Wm. Stevens.

St. Pancras.—11, Woburn-bldgs., u.t. 18 yrs., g.r. 10s., r. 50l. 405
Clapton.—74, Nightingale-rd., f. 870
2, Atherden-rd., u.t. 87½ yrs., g.r. 5l. 5s. 210

By C. C. & T. Moore.

Whitechapel.—Vallance-rd., the Royal George b.-h., a freehold rental of 45l., reversion in 49½ yrs. 1,150
Spitalfields.—115, Buxton-st., and the Crown and Anchor p.-h., area 1,750 ft., f., r. 60l. 1,600
Mile End.—46 and 48, Rutland-st., u.t. 61 yrs., g.r. 5l. 240
15, 17, and 19, Ewing-st., u.t. 75 yrs., g.r. 15l. 15s. 750
Bromley-by-Bow.—85 and 87, Marner-st., u.t. 26 yrs., g.r. 5l. 7s. 330
Limehouse.—15 to 21 (odd), Eastfield-st., f. 800
139, Eastfield-st., f. 200
66 and 68, Carr-st., f. 300
Bethnal Green.—164 to 170 (even), Globe-rd., u.t. 19½ yrs., g.r. 8l. 8s. 500
Bethnal Green.—224 and 226, Green-st.; 1, 2, and 3, Violet-row; and 75 and 77, Moss-st.; u.t. 26 yrs., g.r. 17l. 10s. 800
Highbury.—Ellwood-st., &c., f.g.r. 22l., reversion in 8½ yrs. 2,150
Hoxton.—28, St. John's-rd., f., r. 55l. 820
1 and 3, Myrtle-st., f., r. 66l. 900
18 and 20, Myrtle-st., f. r. 60l. 900
Kingsland.—18 and 20, Philip-st., f. 750
Hackney.—11, Grove-passage, c., r. 35l. 620
Mile End.—15 and 17, Essex-st., f. 570
70, Skidmore-st., f. 390
Bow.—29 and 37, British-st., f. 840
59, British-st., f. 450
Mile End.—Moody-st., a plot of land, area 1,170 ft., f. 180
Old Ford.—74, 76, and 78, Usher-rd., f. 750
Bromley-by-Bow.—27 to 39 (odd), Box-st., f. 1,200

[October 5.—By HARDS & BRADLY.

Greenwich.—Blackwall-lane (near), a plot of riverside land, 1 a. 1 r. 31 p., f. £4,500
43 and 44, Claremont-st., f. 445
59, Dutton-st., u.t. 40½ yrs., g.r. 3l. 260

By JONES, LANG, & CO.

Wimbledon.—Tabor-grove, f.g.r. 21l., reversion in 67 yrs. .....

By VINCENT S. LEIGH.

Hackney.—285, Victoria Park-rd., u.t. 44 yrs., g.r. 5l., r. 36l. .....
72, Cassland-rd., u.t. 54¾ yrs., g.r. 6l. 6s., r. 46l. .....
West Ham.—88, Caistor Park-rd., u.t. 79 yrs., g.r. 6l. .....
92, 94, 25, and 27, Caistor Park-rd., u.t. 79 yrs., g.r. 20l. .....

By VICTOR VAUGHAN.

Beckenham.—Rectory-rd., Mayfield, u.t. 63½ yrs., g.r. 20l., e.r. 120l. .....
Kilburn.—Dunster-gardens, f.g.r. 7l., reversion in 86 yrs. .....

By C. C. & T. MOORE.

Bethnal Green.—227, 231, and 233, Globe-rd., and 94, 96, and 98, James-st., f., also f.g.r. 5l., reversion in 4½ yrs. .....
224, 226, and 232, Globe-rd., f. 1,615
15, Digby-st. and 2, Digby-walk, f. 330
7, 9, 11, and 13, Digby-st. and 1, Digby-walk, f. 950
252, Globe-rd, f., e.r. 50l. 725
1, North-passage and 1, North-pl., f. 325
4, Bullard's-pl., f. 370
3, Sydney-st., f. 670
3 and 5, Norton-st., f. 500
1 and 3, Moss-st., with yard and stabling, f. 750
46, Green-st., f., r. 42l. 855
111 and 146, Green-st., r. 100l. 1,715
203 and 205, Green-st., f., r. 110l. 2,270
15, Winchester-st., f. 275
34 and 36, Camden-st., f. 475
12, Patriot-sq., f. 520
257, Cambridge-rd., f., r. 36l. 650
Mile End.—4 and 5, Allas-rd., f. 825
25, 31, and 33, Portman-pl., f. 1,030

By CHEATLE & HALL (at Lichfield).

Burntwood, Staffs.—Marling's Farm, 65 a. 2 r. 20 p., f. and c. 930
Fulfin or Bank Farm, 106 a. 3 r. 34 p., f. 2,750
Enclosures of land, 32 a. 1 r. 24 p., f. 970
Lichfield, Staffs.—20, Greenhill, f. 170

October 8.—By BROWETT & TAYLOR.

Islington.—225, Essex-rd., u.t. 18 yrs., g.r. 6l., e.r. 48l. .....

By DAVID J. CHATTELL.

Chislehurst Common, Kent.—Green-lane, Mead House, and 2 a. 1 r. 30 p., f. 2,160

By ELLIOTT, SON, & BOYTON.

Marylebone.—3, Devonshire-ter., u.t. 9¾ yrs., g.r. 40l., e.r. 180l. 480

By PYKE & PYKE.

Bloomsbury.—109, Great Russell-st., beneficial lease for 16½ yrs., r. 90l. 250

October 9.—By H. J. BROMLEY.

Forest Hill.—Dartmouth-rd., Belvidere House, and 2½ acres, u.t. 51 yrs., g.r. 20l. 2,500
Penge.—5, 6, 7, 8, and 9, Railway View, u.t. 68 yrs., g.r. 17l. 10s. 400

By E. H. HENRY.

Fulham.—1, Hildyard-rd., u.t. 75 yrs., g.r. 9l., e.r. 45l. 310

By WESTON & SONS.

Brixton.—27, Canterbury-rd., u.t. 61 yrs., g.r. 5l. 10s., e.r. 50l. 500

By T. G. WHARTON.

Fulham.—Rowallan-rd., f.g.r. 67l., reversion in 97 yrs. .....
Mablethorpe-rd., f.g.r. 133l. 10s., reversion in 97 yrs. 1,705
Lambrook-ter., i.g.r. 336l., u.t. 94 yrs, g.r. 56l. 10s. 3,440
6,000

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 16 0	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 12 0	,,	,, ,,
Smooth Bright Facing Stocks..	2 18 0	,,	,, ,,
Shippers	2 2 0	,,	,, ,,
Flettons.....	1 10 0	,,	at railway depôt.
Red Wire Cuts ..	1 15 0	,,	,, ,,
Best Fareham Red	3 11 6	,,	,, ,,
Best Red pressed Ruabon Facing.	5 5 0	,,	,, ,,
Best Blue Pressed Staffordshire ..	4 7 0	,,	,, ,,
Do., Bullnose	4 12 0	,,	,, ,,
Best Stourbridge Fire Bricks	4 4 6	,,	,, ,,
GLAZED BRICKS.			
Best White and Ivory Glazed Stretchers.....	13 0 0	,,	,, ,,
Headers	12 0 0	,,	,, ,,
Quoins, Bullnose, and Flats	17 0 0	,,	,, ,,
Double Stretchers	19 0 0	,,	,, ,,
Double Headers..	16 0 0	,,	,, ,,
One Side and two Ends	19 0 0	,,	,, ,,
Two Sides and one End	20 0 0	,,	,, ,,
Splays, Chamfered, Squints	20 0 0	,,	,, ,,

PRICES CURRENT (*Continued*).

	£ s. d.		
Best Dipped Salt Glazed Stretchers and Headers ..	12 0 0	per 1,000,	at railway depôt.
Quoins, Bullnose, and Flats	14 0 0	,,	,, ,,
Double Stretchers	15 0 0	,,	,, ,,
Double Headers..	14 0 0	,,	,, ,,
One Side and two Ends	15 0 0	,,	,, ,,
Two Sides and one End	15 0 0	,,	,, ,,
Splays, Chamfered, Squints	14 0 0	,,	,, ,,
Seconds Quality White and Dipped Salt Glazed	2 0 0	,,	less than best.

	s. d.		
Thames and Pit Sand	8 0	per yard,	delivered.
Thames Ballast	6 9	,,	,,
Best Portland Cement	37 6	per ton	,,
Best Ground Blue Lias Lime..	24 0	,,	,,

NOTE.—The cement and lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 12s. 6d. per yard, delivered.
Stourbridge Fire-clay in sacks, 32s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
Ancaster in blocks	2 0	per ft. cube,	deld. rly. depôt
Bath ,, ...	1 7	,,	,,
Farleigh Down Bath ..	1 8	,,	,,
Beer in blocks	1 6½	,,	,,
Grinshill ,, ...	1 10	,,	,,
Brown Portland in blocks	2 2	,,	,,
Darley Dale ,,	2 1½	,,	,,
Red Corsehill ,,	2 5	,,	,,
Red Mansfield ,,	2 4½	,,	,,
Hard York ,,	2 10	,,	,,
Hard York 6 in. sawn both sides landings, to sizes (under 40 ft. sup.)	2 7	per ft. super.	at rly. depôt.
,, ,, 6 in. Rubbed Ditto..	2 10½	,,	,,
,, ,, 3 in. sawn both sides slabs (random sizes)	1 3	,,	,,
,, ,, 3 in. self-faced Ditto	0 9	,,	,,

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor..	11 5 0	per 1000 of 1200	at ry. dep.
,, best seconds ,,	10 15 0	,,	,,
16× 8 best ,,	6 2 6	,,	,,
20×10 best blue Portmadoc ..	10 18 0	,,	,,
16× 8 best blue Portmadoc	6 0 0	,,	,,
20×10 best Eureka unfading green.....	11 2 6	,,	,,
16× 8 ,, ,,	6 15 0	,,	,,
20×10 Permanent green	10 0 0	,,	,,
16× 8 ,, ,,	5 12 6	,,	,,

TILES.

	s. d.		
Best plain red roofing tiles..	41 6	per 1,000	at rly. depôt.
Hip and valley tiles....	3 7	per doz.	,, ,,
Best Broseley tiles	48 6	per 1,000	,, ,,
Hip and valley tiles....	4 0	per doz.	,, ,,
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000	,, ,,
Do. ornamental Do.	60 0	,,	,, ,,
Hip tiles.....	4 0	per doz.	,, ,,
Valley tiles.....	3 9	,,	,, ,,
Best Red or Mottled Staffordshire Do. (Peakes) .	50 9	per 1,000	,, ,,
Hip tiles	4 1	per doz.	,, ,,
Valley tiles.....	3 8	,,	,, ,,

WOOD.

BUILDING WOOD.—YELLOW.

	At per standard. £ s. d.	£ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9in. and 11 in.	16 10 0	18 0 0
Deals: best 3 by 9	14 10 0	15 10 0
Battens: best 2½ in. by 7 in. and 8 in. and 3 in. by 7 in. and 8 in.....	12 10 0	13 10 0
Battens: best 2½ by 6 and 3 by 6 ..	0 10 0	less than 7 in. and 8 in.
Deals: seconds	1 0 0	less than best
Battens: seconds.....	0 10 0	,, ,,

	At per load of 50 ft.		
Fir timber: Best middling Danzig or Memel (average specification)	4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Swedish balks.....	2 15 0	3 0 0	
Pitch pine timber (35 ft. average)..	4 0 0	4 10 0	

JOINERS' WOOD.

	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.....	27 10 0	28 10 0	
3 in. by 9 in.	24 0 0	25 0 0	
Battens, 2½ in. and 3 in. by 7 in.	20 0 0	21 0 0	
Second yellow deals, 3 in. by 11 in.	22 10 0	24 0 0	
,, ,, 3 in. by 9 in.	20 0 0	21 0 0	
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	18 0 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	16 10 0	18 0 0	
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	25 0 0	26 0 0	
Do. 3 in. by 9 in.	22 0 0	23 0 0	
Battens.....	16 10 0	17 10 0	
Second yellow deals, 3 in. by 11 in.....	18 10 0	20 0 0	
Do. 3 in. by 9 in.	17 0 0	18 0 0	
Battens.....	14 0 0	14 10 0	
Third yellow deals, 3 in. by 11 in.....	15 0 0	16 10 0	
Do. 3 in. by 9 in.	14 0 0	14 10 0	
Battens.....	12 10 0	13 10 0	
White Sea and Petersburg:—			
First white deals, 3 in. by 11 in..	15 10 0	16 10 0	
,, ,, ,, 3 in. by 9 in. ..	14 0 0	15 0 0	
Battens.....	12 10 0	13 10 0	
Second white deals 3 in. by 11 in.	14 0 0	15 0 0	
,, ,, ,, 3 in. by 9 in.	13 0 0	14 0 0	
,, ,, battens	11 0 0	12 0 0	
Pitch pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	

PRICES CURRENT (*Continued*).

	At per standard. £ s. d.	£ s. d.
Yellow Pine—		
First, regular sizes	30 0 0	33 0 0
Broads (12 in. and up)	2 0 0	more.
Oddments	22 0 0	24 0 0
Seconds, regular sizes	24 10 0	26 10 0
Yellow Pine Oddments	20 0 0	22 0 0
Kauri Pine—		
Planks, per ft. cube	0 3 6	0 4 6
Danzig and Stettin Oak Logs—		
Large, per ft. cube	0 2 6	0 2 8
Small ,, ,, ...	0 2 4	0 2 -
Wainscot Oak Logs, per ft. cube ..	0 5 0	0 - -
Dry Wainscot Oak, per ft. sup. as inch	0 0 8	0 0 -
¾ in. do. do.	0 0 7	- - -
Dry Mahogany—		
Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0
Dry Walnut, American, per ft. sup. as inch.....	0 0 10	0 1 0
Teak, per load	16 0 0	20 0 0
American Whitewood Planks—		
Per ft. cube.....	0 2 3	0 3 0

JOISTS, GIRDERS, &c.

	In London, or delivered to Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	9 2 6	10 2 6
Compound Girders ,, ,,	12 5 0	13 10 0
Angles, Tees and Channels, ordinary sections	12 10 0	14 10 0
Flitch Plates	11 7 6	12 0 0
Cast Iron Columns and Stanchions, including ordinary patterns	8 15 0	10 10 0

METALS.

	Per ton, in London. £ s. d.	£ s. d.
IRON.—		
Common Bars.....	10 0 0	10 10 0
Staffordshire Crown Bars, good merchant quality	10 15 0	11 5 0
Staffordshire "Marked Bars" ..	13 5 0	- - -
Hoop Iron, basis price.....	11 0 0	11 10 0
,, ,, galvanised	17 0 0	- - -
(* And upwards, according to size and gauge.)		
Sheet Iron, Black.—		
Ordinary sizes to 20 g.	11 5 0	- - -
,, ,, to 24 g.	12 10 0	- - -
,, ,, to 26 g.	13 10 0	- - -
Sheet Iron, Galvanised, flat, ordinary quality.—		
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.....	14 15 0	- - -
,, ,, 22 g. and 24 g.	15 5 0	- - -
,, ,, 26 g.....	16 15 0	- - -
Sheet Iron, galvanised, flat, best quality.—		
Ordinary sizes to 20 g.	18 0 0	- - -
,, ,, 22 g. and 24 g.	18 10 0	- - -
,, ,, 26 g.....	20 0 0	- - -
Galvanised Corrugated Sheets.—		
Ordinary sizes, 6 ft. to 8 ft. 20 g.	13 15 0	14 10 0
,, ,, 22 g. and 24 g.	14 10 0	15 10 0
Cut nails, 3 in. to 6 in.....	11 10 0	- - -
(Under 3 in. usual trade extras.)		
LEAD—Sheet, English, 3 lbs. & up.	20 7 6	- - -
Pipe in coils	20 17 6	- - -
Soil Pipe..	23 17 6	- - -
ZINC—Sheet—		
Vieille Montagne ..... ton	28 0 0	- - -
Silesian.....	27 10 0	- - -
COPPER—		
Strong Sheet..... per lb.	0 1 1	- - -
Thin ..... ,,	0 1 3	- - -
Copper nails ..... ,,	0 1 3	- - -
BRASS—		
Strong Sheet..... ,,	0 0 11	- - -
Thin ,, ... ,,	0 1 1	- - -
TIN—English Ingots ..... ,,	0 1 6	- - -
SOLDER—Plumbers' ..... ,,	0 0 8	- - -
Tinmen's ..... ,,	0 0 10	- - -
Blowpipe ..... ,,	0 1 0	- - -

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2½d. per ft. delivered.
,, fourths	2½d. ,, ,,
21 oz. thirds	3½d. ,, ,,
,, ,, fourths.....	3d. ,, ,,
26 oz. thirds	4½d. ,, ,,
,, ,, fourths	4d. ,, ,,
32 oz. thirds	5½d. ,, ,,
,, ,, fourths	5d. ,, ,,
Fluted sheet, 15 oz.	3½d. ,, ,,
,, ,, 21 ,, ...	4½d. ,, ,,
½ Hartley's Rolled Plate.....	3d. ,, ,,
⅜ ,, ,, ,, -----	3½d. ,, ,,
½ ,, ,, ,, -----	4d. ,, ,,

OILS, &c.

	£ s. d.	
Raw Linseed Oil in pipes.....	per gallon	0 3 1
,, ,, ,, in barrels	,,	0 3 2
,, ,, ,, in drums	,,	0 3 4
Boiled ,, ,, in pipes.....	,,	0 3 4
,, ,, ,, in barrels	,,	0 3 5
,, ,, ,, in drums	,,	0 3 7
Turpentine, in barrels	,,	0 2 7
,, in drums.....	,,	0 2 9
Genuine Ground English White Lead ...per ton		27 10 0
Red Lead, Dry.....	,,	25 0 0
Best Linseed Oil Putty.....per cwt.		0 9 6
Stockholm Tar ..... per barrel		1 8 0

VARNISHES, &c.

	per gallon. £ s. d.
Fine Elastic Copal Varnish or outside work ..	0 16 6
Best Elastic Copal Varnish for outside work ..	1 0 0
Best Elastic Carriage Varnish for outside work	0 16 6
Best Hard Oak Varnish for inside work	0 10 6
Best Extra Hard Church Oak Varnish for inside work	0 10 6
Fine Hard Copal Varnish for inside work	0 16 0
Best Hard Copal Varnish for inside work	1 0 0

[*See also next page.*

COMPETITIONS, CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered
Bridge	Newcastle-on-Tyne Corporation	Not stated	Nov. 15
Parade Extension	Bridlington Corporation	35 guineas and 15 guineas	Dec. 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Forms of Tender, &c., Supplied by	Tenders to be delivered
*Road Making, &c.	Willesden District Council	Engineer, Public Offices, Dyne-road, Kilburn, N.W.	Oct. 22
Offices, &c., Old Oak Common, near Acton	Great Western Railway Company	G. K. Mills, Paddington Station, W.	do.
Villa, Cwmla-road, Neath	.....	J. C. Rees, Architect, Neath	do.
Building Work, Chapel-street	Stratford-on-Avon Corporation	R. Dixon, Civil Engineer, Municipal Offices	do.
Engine House Works, Dockfield	Shipley (Yorks.) U.D.C.	S. Jackson & Son, Architects, Tanfield Chambers, Bradford	do.
Road Works	Uttoxeter (Staffs.) R.D.C.	J. Preston, Surveyor, Woodlands, Uttoxeter	do.
Works at Workhouse	Leeds Guardians	J. C. Ford, Poor Law Offices, East Parade, Leeds	do.
*Alterations to Drains	Woolwich Guardians	Union House, Woolwich	Oct. 24
Road Works, Hemdean-rise	Caversham U.D.C.	S. P. Andrews, Surveyor, 22, Prospect-street, Caversham	do.
Rebuilding Black Swan Inn, Stockingford	Messrs. Atkinson's Brewery, Ltd.	H. W. Chattaway, Architect, Trinity Churchyard, Coventry	do.
Nurses' Home	Stoke-on-Trent Guardians	C. Lynam, Architect, Stoke-on-Trent	do.
Road Widening, Bailey Hall	Halifax Corporation	J. Lord, Borough Engineer, Town Hall	do.
Boundary Walls, &c., West Didsbury	Withington U.D.C.	J. Cartwright, Civil Engineer, Market-place, Bury	do.
Road Works, &c.	Renfrew Parish Council	P. Kerr, Civil Engineer, Johnstone, N.B.	do.
Library, Cathays, Cardiff	.....	Jones & Co., Architects, 18, St. Mary-street, Cardiff	do.
Engine House, &c., Catshill, near Bromsgrove	East Worcestershire Water Co.	E. B. Marten, Engineer, Church-street Chambers, Stourbridge	do.
Rebuilding Fishburn Bridge	Durham County Council	W. Crozier, Civil Engineer, Shire Hall, Durham	do.
Cottage, Lossie Wynd, Elgin, N.B.	.....	Reid & Wittet, Architects, Elgin	do.
Electricity Station, Bloom-street	Manchester Corporation	F. E. Hughes, Town Hall	do.
Inn, York-road, Fisherton, Salisbury	Messrs. J. Folliott & Sons	J. Harding & Son, Architects, Salisbury	do.
Alterations to Business Premises, Leeds	Mr. F. Davis	H. Walker, Architect, 8, Upper Fountaine-street, Leeds	do.
Alterations to Police Station, Merthyr	Glamorgan County Council	T. M. Franklen, Westgate-street, Cardiff	do.
*Old Materials	Camberwell Guardians	Clerk, Guardians' Offices, 29, Peckham-road, S.E.	do.
*Pipes	Bombay Corporation	J. Taylor, Sons & Santo Crimp, 27, Great George-street, S.W.	Oct. 25
Brick Culvert	Walker, Northumberland, U.D.C.	T. M. Sturgess, 5, St. Nicholas-buildings, Newcastle	do.
Building Eight Houses, Ardsley, Yorks.	.....	Jones Brothers, Builders, Stairfoot, York	do.
Alterations to No. 1 Wood-street, Stratford-on-Avon	.....	A. Lacey, 1, Wood-street, Stratford-on-Avon	do.
Additions to Schools, Loxton-street	Birmingham School Board	Martin & Martin, Architects, 106, Colmore-row, Birmingham	Oct. 26
Additions to Schools, Gem-street	do.	do.	do.
*Granite, &c.	Bexhill U.D.C.	.....	do.
*Hospital	Fylde, Preston, &c. Jt. Hos. Com.	See Advertisement	do.
School	Avington (Hants.) School Board	Colson, Farrow, & Nisbett, Archts., 45, Jewry-street, Winchester	Oct. 27
Street Works	Swindon U.D.C.	H. J. Hamp, Surveyor, Regent Circus, Swindon	do.
Engine House, &c., at Gasworks	Kendal Corporation	T. N. Ritson, Civil Engineer, Parkside, Kendal	Oct. 29
Road Works, Ovenden-road	Halifax Corporation	J. Lord, Borough Engineer, Town Hall	do.
Refuse Destructor	Partick (N.B.) Commissioners	Burgh Surveyor, 17, Peel-street, Partick	do.
*Alterations to School Buildings	Waltham Holy Cross Sch. Bd.	Clerk, School Board Offices, Waltham Abbey	do.
Road Works, Rake-lane, Clifton	Barton-upon-Irwell R.D.C.	C. C. Hooley, Civil Engineer, Union Offices, Patricroft	Oct. 30
Nurses' Home, Wednesbury-road, Walsall	Committee	Bailey & McConnal, Architects, Bridge-street, Walsall	do.
Laying, &c., C.I. Main	Clevedon (Somerset) Water Co.	J. Mansergh, Engineer, 5, Victoria-street, Westminster	do.
Business Premises, Swadford-street, Skipton	Mr. A. R. Stockdale	J. Hartley, Architect, Exchange Buildings, Skipton	do.
*Fencing	Hackney Vestry	Surveyor, Town Hall, Hackney, N.E.	do.
Offices, Dock-street, Middlesbrough	N. E. Railway Company	W. Bell, Architect, York	Oct. 31
Passage Works, Towcester-street, &c.	Litherland (Lancs) U.D.C.	W. B. Garton, Surveyor, 25, Sefton-road, Litherland	do.
*Fencing	Wanstead U.D.C.	Surveyor's Department, Council Offices, Wanstead	Nov. 1
Institute and Hall, Nantymoel	.....	Jacob Rees, Architect, Pentre	Nov. 2
Sewers, &c.	Northwich R.D.C.	H. Bancroft & Son, Civil Engineers, 88, Mosley-st., Manchester	Nov. 8
*Filter Bed	Petersfield U.D.C.	Surveyor, Council Offices, High-street, Petersfield	Nov. 14
Kerbing, &c., St. George's-road and others	Barnsley Town Council	J. H. Taylor, Civil Engineer, Town Hall, Barnsley	do.
House, Crosshaven, N.B.	Mr. R. Baxter	A. Hill, Architect, 23, George's-street, Cork	No date
Houses, East Burnside, Cupar, Fife	.....	H. Bruce, County Buildings, Cupar, Fife	do.
Four Houses, Stanley-road, Wakefield	.....	W. Wrigley, Architect, 6, Westgate, Wakefield	do.
Road Works, &c., Byfleet, Surrey	.....	F. S. S. Taylor, Architect, 5, John-street, Bedford-row, W.C.	do.
Granite (2,000 tons)	.....	C. & A. Musker, Limited, Tuebrook, Liverpool	do.
Rebuilding Moot Hall, Wheelergate, Nottingham	.....	A. R. Calvert, Architect, Low Pavement, Nottingham	do.
Repairs, &c., to Church, Elberton, near Bristol	.....	A. C. Jones, The Court, Elberton	do.
Mission Room, East Common, Selby	.....	Garside & Pennington, Architects, Pontefract	do.
Additions to Business Premises, Carlton-st. Castleford	Mr. C. Farber	do.	do.
Chimney at Brewery, Woodlesford, near Leeds	Messrs. Bentley's, Limited	R. W. Higgins, Architect, Messrs. Bentley's Brewery, Woodlesford	do.
Two Cottages, Claverham, Yalton	.....	C. A. Rowley, Architect, 38, College Green, Bristol	do.

PUBLIC APPOINTMENTS

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Clerk of Works	Liverpool Vestry	3 guineas per week	Oct. 25
*Junior General Assistant and Tracing Assistant	Wallasey U.D.C.	85*l.* and 78*l.* per annum	do.
*Assistant Draughtsman	Metropolitan Asylums Board	2*l.* 2*s.* per week	Oct. 26
*Clerk of Works	Croydon County Council	3*l.* 10*s.* per week	Oct. 29
*City Architect	Bradford Corporation	400*l.* per annum	Oct. 31
*Clerk of Works	East Ham U.D.C.	4*l.* 4*s.* per week	Nov. 3

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. Contracts, pp. iv. vi. viii. x. & xxi. Public Appointments, pp. xviii. xix. & xxi.

PRICES CURRENT (*Continued*).

VARNISHES, &c.

	per gallon. £ s. d
Best Hard Carriage Varnish for inside work	0 16 0
Extra Pale Paper Varnish	0 12 0
Best Japan Gold Size	0 10 0
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 9 0
Brunswick Black	0 9 0
Berlin Black	0 15 0
Knotting	0 10 0
Best French and Brush Polish	0 10 0

TO CORRESPONDENTS.

J. J. B. & Son.—A. H. (Amounts should have been stated.)

NOTE.—The responsibility of signed articles, letters, and papers read at meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

We are compelled to decline pointing out books and giving addresses.

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All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than 10 a.m. on Thursdays.* N.B.—We cannot publish tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of tenders accepted unless the amount of the tender is given, nor any list in which the lowest tender is under £100, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

ALCESTER.—For rebuilding business premises, Evesham-street, for the Alcester Co-operative Industrial Society, Limited. Mr. J. W. Adams, architect, Hay Mills, Birmingham:—

Huxley Bros., Astwood Bank, Redditch* £2,097

BRIDLINGTON QUAY (Yorks.).—For the erection of a house, St. John's-avenue, for Mr. A. Jennison. Mr. J. Earnshaw, architect, Wellington-road, Bridlington Quay:—

J. Rennard	£456 0 0	Barr & Booth	£349 3 0
G. Walkington	439 14 0	Smallwood & Shaw	337 3 6
E. Corner	439 0 0	A. Gardam	333 0 0
C. Simon	398 0 0	T. Spink, Bridlington*	301 11 0
T. Atkin	379 9 0		
W. Barnes	378 0 0		

DERBY.—For the reconstruction of Crossley and Beighton-streets, for the Ripley Urban District Council. Mr. R. Argile, surveyor, Oxford-street, Ripley. Quantities by the surveyor:—

Beighton-street.

John Coupe, Ripley, Derby	£136 11 4½
S. Richmond & Co., New Lenton, near Nottingham*	123 3 8

Crossley-street.

S. Richmond & Co., New Lenton, near Nottingham	154 3 6
John Coupe, Ripley, Derby*	149 17 8

HERTFORD.—For the erection of a fire station house, stables, &c., Mill road, for the Corporation. Mr. J. H. Jevons, C.E., Town Hall, Hertford:—

Stims & Co.	£2,000 0 0	Norris & Son	£1,855 0 0
Laurance & Son	1,994 0 0	E. R. Kemp Hertford*	1,839 12 8
E. West	1,935 0 0		

[Engineer's estimate, £1,850.]

HINDLEY (Lancs.).—For reconstructing a stone culvert, Swan-lane, for the Urban District Council. Mr. A. Holden, C.E., Council Offices, Hindley:—

W. Winnard	£249 16 6	H. & F. Lomax, Hindley*	£170 0 0
Jno. Dickinson	230 0 0		
W. McKenzie	200 0 0		

KIRKCALDY.—For new class rooms and cookery room at Dysart North Public School, for the Dysart Burgh School Board. D. Forbes Smith, architect, Kirkcaldy. Quantities by the architect:—

Masonry.—Balfour Bros., Rosabelle-street, Sinclairtown*	£896 0 0
Joinery.—Geo. Hay & Son, Relief-street, Dysart*	472 10 0
Plastering.—A. Hutchison, Aitken-street, Sinclairtown*	142 19 6
Slating.—D. Stark, Whytehouse Mansions, Kirkcaldy*	79 10 0
Plumbing.—James Crombie, Windmill-road, Gallatown*	241 18 11½
	£1,832 18 5½

LIMERICK.—For the erection of an electric generating station, Frederick-street, for the Town Council. Mr. J. J. Peacocke, surveyor, Town Hall, Limerick:—

Gough, Colooney-street, Limerick	£3,925
Bourke, Carr-street, Limerick	2,650

LONDON.—For additions, &c., to public library, Duke's-avenue, for the Chiswick Urban District Council. Mr. Arthur Ramsden, surveyor, Sutton Court-road, Chiswick. Quantities by Messrs. Morris Evans & Son, John-street, Adelphi, W.C.:—

Vigor	£1,450 0 0	Heath	£961 13 9
Gibson	1,250 0 0	Somerford & Sons	959 0 0
Foster Bros.	1,233 0 0	E. Wall, Wandsworth	906 0 0
Whitman	1,129 0 0		
Wisdom	1,060 0 0		
Heeps	1,013 0 0		

LONDON.—For the erection of licensed premises, stores, stables, &c., on site of old Crown Brewery, Loampit Vale, Lewisham, for Messrs. Thorne Bros. Messrs. Douglas Young & Co., architects, 51, Coleman-street. Quantities by Mr. Frederick G. Fletcher, 61, Chancery-lane:—

		Extra for Jarrah Wood in lieu of Staffordshire Paving.	Two Extra Shops.
H. Groves	£3,979	£56 16	£1,304
W. Rowe	3,935	40 0	1,292
F. & H. F. Higgs	3,830	30 0	1,240
Turtle & Appleton	3,760	30 0	1,235
G. Parker	3,745	50 0	1,249
Marsland & Sons	3,675	48 0	1,195
Matthews Bros.	3,563	49 0	1,147
Holliday & Greenwood	3,497	51 0	1,115
Foster Bros.	3,478	9 0	1,294
Jerrard & Sons	3,373	47 0	1,063
H. Line‡	3,126	64 0	1,050

‡ Accepted omitting two extra shops.

LONDONDERRY.—For additions, &c., to nurses' rooms, workhouse infirmary, for the Guardians. Mr. M. A. Robinson, C.E., Richmond-street, Londonderry:—

Robert Colhoun, Strand-road, Londonderry £350

ERITH (Kent).—For the erection of forty-eight cottages, Brook-street, Belvedere, and a lodge at the recreation ground, for the Urban District Council. Mr. Harold Hind, Surveyor, Erith Urban District Council:—

—	Twenty-four Cottages, Class A, Containing Six Rooms. With Stock Bricks.	Twenty-four Cottages, Class B, Containing Five Rooms. With Stock Bricks.	Twenty-four Cottages, Class A, Containing Six Rooms. With Place Bricks in Internal Walls.	Twenty-four Cottages, Class B, Containing Five Rooms. With Place Bricks in Internal Walls.	Superintendent's Lodge.
Martin, Wells, & Co.	£10,250	£9,250	£10,200	£9,225	£750 0
Frank Parsons	9,390	8,790	9,150	8,550	575 0
Gunning & Son	7,200	6,600	7,080	6,480	420 0
O. H. Evans	6,984	6,600	6,840	6,456	—
Enness Bros.	6,576	6,024	6,420	5,868	485 0
H. J. Evans	6,390	5,790	6,200	5,612	—
W. Richardson & E. Woodley, S. Wimbledon*	6,000	5,040	5,760†	4,800†	300 0†
J. T. Jarvis	—	—	—	—	498 0
G. Wyman	—	—	—	—	398 15
Spencer & Son	—	—	—	—	394 10

REDRUTH.—For alterations, &c., to East-end schools for the School Board. Mr. Sampson Hill, architect, Green-lane, Redruth:—

John Odgers, Redruth £1,210

RIPLEY, DERBY.—For laying, &c., 1,120 yards sewers, &c., for the Urban District Council. Mr. Robert Argile, C.E., Public Offices, Ripley. Quantities by the surveyor:—

Jno. Coupe, Ripley, Derby	£613 13 7
S. Richmond & Co., New Lenton, near Nottingham*	589 0 0

SHREWSBURY.—For the erection of residence for Mr. Frank Plimley. Messrs. Dalgleish & Dickens-Lewis, architects, Shrewsbury. Quantities by the architects:—

Building.

Price & Sons	£865	Wm. Pace	£720
Walter Richards	797	Thos. Pace*	690
Farmer & Sons	731		

Plumbing.

Scull Bros.	£113 6 10	Morris & Co.*	£107 0 0
Marston & Co.	109 17 0		

[All of Shrewsbury.]

SOUTHAMPTON.—For new schools at Shirley, for the Southampton School Board to accommodate 1,500 children. Mr. John H. Blizard (Messrs. Lemon & Blizard), Southampton, Surveyor to the Board. Quantities by the Surveyor:—

Rashleigh & Sons	£19,810	Jenkins & Sons*	£19,467
Stevens & Co.	19,720	Architect's Estimate	19,776
Goulding & Ansell	19,500		

[All of Southampton.]

SURBITON.—For the erection of store-rooms, entrance gates, &c., Alpha-road, for the Urban District Council. Mr. Samuel Mather, surveyor, Ewell-road, Surbiton:—

J. Hill	£1,130 16	Sease & Son	£810 0
J. H. Jarvis	1,095 0	J. Allwork	765 0
B. Cropley	875 0	McDonald & Sons, Surbiton*	688 0
J. B. Tomkinson	855 0	G. King‡	579 0
Highy & Ralson	815 0		

‡ Withdrawn.

[Surveyor's Estimate £684.]

TUNBRIDGE WELLS.—For the erection of chimney shaft, &c., 180 ft. in height, for the Corporation. Mr. W. H. Maxwell, A.M.Inst.C.E., Town Hall, Tunbridge Wells:—

Foster Bros.	£6,495 0 0	R. B. H. Neal	£4,713 0 0
Tinkers, Ltd.	5,126 3 8	Myles & Warner	4,385 5 10
Anderson & Co.	4,928 9 4	J. Jenkins, Swansea*	3,835 2 4
Wilson Bros.	4,789 0 0		

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board, the Works Committee submitted the following list of tenders. Mr. T. J. Bailey is the Board's Architect:—

* *Denotes accepted.*
‡ *Recommended for acceptance.*

BRUNSWICK-ROAD.—Adapting building for a day industrial school for 150 children:—

T. L. Green	£5,467	Stevens Bros.	£4,628
Glover & Son	4,764	Lawrance & Sons	4,562
Wall & Co.	4,725	F. & F. J. Wood‡	4,489

HANBURY-STREET.—New school—boys, 274; girls, 274; infants, 274; total, 822. Graded school on three stories with boys' and infants' covered playgrounds, &c., under school, and girls' playground on top of building. Halls—boys', 50 ft. 9 in. by 30 ft. 4½ in.; girls', 50 ft. 9 in. by 30 ft. 4½ in.; infants', 50 ft. 9 in. by 30 ft. Classrooms—boys', 50, 56, 56, 56, 56; girls', 50, 56, 56, 56, 56; infants', 50, 56, 56, 56, 56. Drawing classroom, 1,009 sq. ft.; heating and ventilation by propulsion system; area of site, about 21,295 sq. ft. Playgrounds, area per child—boys', 23 sq. ft.; girls', 14 sq. ft. (on top of building); infants', 28 sq. ft. Schoolkeeper's house:—

			A.
Leslie & Co., Limited	£27,275	+	£347
T. L. Green	26,415		—
J. Longley & Co.	26,390	+	350
Clarke & Bracey	25,990	+	380
Treasure & Son	25,865	+	244
Kirk & Randall	25,761	+	365
Perry & Co.	25,697	+	430
F. & F. J. Wood	25,656	+	400
J. Grover & Son	25,421	+	363
C. Cox	25,401	+	360
E. Lawrance & Sons*	25,267	+	310
Miskin & Sons	24,264	+	300

A. If walls of classrooms and halls are plastered *add.*

HITHER GREEN—Industrial and Truant Schools, Catford.—Industrial School—Accommodation, 150 boys. Ground floor—Three classrooms, two workshops, reading-room, playroom, needlework-room, dining-room, lavatory, bath and dressing-rooms, general administrative offices, including residence for Governor and staff. First floor—Four dormitories, water-closets, and lavatories and storerooms, and cubicles for older boys. Second floor—accommodation for female staff. Buildings common to both institutions—manual training-room, 70 ft. by 22 ft.; swimming-bath, 70 ft. by 32 ft.; gymnasium, 48 ft. 6 in. by 24 ft., with dressing-rooms, bandroom 24 ft. by 18 ft., bakery, large and small washhouse and ditto laundry, boiler-house, and coal store. Infirmary building—Receiving ward (one bed), two sick wards (six beds each), day and nightrooms for nurse, dispensary, and clothes store, &c. Out-buildings—Two drill sheds, 80 ft. by 20 ft. each, and band stand:—

Martin, Wells, & Co.	£96,752	E. Lawrance & Sons	£86,534
Leslie & Co., Ltd.	95,691	Treasure & Son	85,626
W. J. Mitchell & Son	95,270	Holliday & Greenwood	84,777
Spencer, Santo, & Co., Ltd.	89,980	W. H. Lorden & Son	84,444
McCormick & Sons	89,853	C. Miskin & Sons	83,448
Killby & Gayford	89,096	F. & H. F. Higgs	83,322
S. Hart	88,186	G. E. Wallis & Sons	83,273
J. Grover & Son	87,989	J. & M. Patrick	81,990
Kirk & Randall	87,902	J. Garrett & Son	81,472
Stimpson & Co.	87,472	J. Smith & Sons, Norwood, Ltd.‡	81,472
W. Johnson & Co., Ltd.	86,536		

MARLBOROUGH-ROAD.—Improvements and enlargement—ground floor, infants' department. Providing 3 new classrooms, 56, 50, 50; reducing classroom G from 100 to 50; providing new hall, 67 ft. by 30 ft., cloakrooms, lavatory, teachers' room and stockroom; altering door openings to classrooms C, D, and F, and providing new doors and building up existing openings in classroom G; converting existing area in Marlborough-road into furnace-room and coalcellar; extending existing coalcellar under cloakroom; providing 4 new staircases to boys' and girls' departments; removing roof over present hall and forming open court; refixing covered playground and providing new water-closets. Gain, 106 places. First floor, girls' department.—Providing 3 new classrooms, 56, 50, 50; reducing classroom G from 90 to 50; new hall, 67 ft. 4½ in. by 30 ft.; cloakrooms, lavatories, teachers' room, and stock-room, and extending corridor; removing existing mezzanine floors; forming new windows to open court from hall and corridor; altering door openings to classrooms C, D, and F, providing new doors, &c., and building up existing openings in classroom G; providing new glazed partition between corridor and existing lavatory, where, mezzanine removed; 4 new staircases for boys and girls; new water-closets on ground and roof playgrounds. Gain, 116 places. Second floor boys' department.—Providing 3 new classrooms, 56, 50, 50; reducing classroom G from 93 to 50; new hall, 67 ft. 4½ in. by 30 ft. 4½ in.; cloakrooms, lavatory, teachers' room and stockroom; four new staircases for boys and girls: removing existing mezzanine floor, forming additional new corridor; also new windows to open court from hall and corridor; providing new glazed partition between corridor and existing lavatory where mezzanine is removed; altering openings and providing new doors to classrooms C, D, and F, and building up existing opening in classroom G; providing two new water-closets in playground. Gain, 113 places. Third floor.—Providing drawing classroom, 900 square ft. area; girls' open and covered playground and water-closets; two girls' staircases and boys' staircase; enclosing, draining, and tar-paving the additional land; heating by low-pressure hot-water apparatus. Revised accommodation—Boys, 512; girls, 510; infants, 588; total, 1,610. Net gain, 335.

Wallis & Sons	£19,796	Lathey Bros.	£18,760
Lorden & Son	19,352	Lawrance & Sons	18,285
Treasure & Son	18,968	Stimpson & Co.	18,200
Leslie & Co., Ltd.	18,884	Miskin & Sons	18,023
Patman & Fotheringham, Ltd.	18,771	C. Cox‡	17,990
		Garrett & Son	17,249

NORTHWOLD-ROAD.—New School. Accommodation, boys, 306; girls, 306; infants, 306; total, 918. Graded school on three stories. Halls, boys, 1,998 square feet about; girls, 1,998 square feet about; infants, 1,998 square feet about. Classrooms, boys, 40, 40, 56, 50, 60, 60; girls, 40, 40, 56, 50, 60, 60; infants, 40, 40, 56, 50, 60, 60. Special Rooms—Drawing classroom, 1,050 ft. Heating by low-pressure hot-water apparatus. Area of site about 57,800 square feet. Playgrounds area per child, boys, 65 ft.; girls and infants, 34 ft. New house for school-keeper:—

T. L. Green	£26,987	Treasure & Son	£24,621
Patman & Fotheringham, Ltd.	26,163	W. Shurmur	24,498
Leslie & Co., Ltd.	26,103	Miskin & Sons	24,428
J. Grover & Son	25,917	Johnson & Co., Ltd.	24,344
E. Lawrance & Sons	25,465	W. M. Dabbs	24,317
		C. Cox‡	23,948

[*See also next page.*

WESTVILLE-ROAD.—Rebuilding and fitting with separate pans and traps girls' offices, including the removal of the old offices, also removing and refixing covered playground, altering and refitting with separate pans and traps boys' offices, including reconstructing urinal; altering and refitting with separate pans and traps the male and female infants' offices, including new urinal for male infants, constructing new chambers, altering old chambers, laying new soil drains from offices; relaying the drain from disconnecting chamber now receiving the drainage from the laundry down to the intercepting chamber, reconnecting the old surface water drainage to new system, taking out old disused soil drains, refitting the schoolkeeper's closet and providing new sink in scullery, and ventilating pipes for new drains:—

Martin, Wells & Co.	£2,500 0 0	R. P. Beattie	£2,087 12 7½
Unsigned	2,483 0 0	G. Neal‡	1,977 0 0
Johnson & Co., Ltd.	2,108 0 0		

WILLIAM-STREET.—Providing and fixing iron staircase:—

McDowall, Steven, & Co., Ltd.	£90 10	Hayward Bros. & Eckstein, Ltd.‡	£44 10
St. Pancras Ironwork Co., Ltd.	49 10		

WOODLAND-ROAD.—Refitting the boys', girls', and female infants' offices with separate pans and traps, removing and rebuilding the male infants' offices, including coal store for schoolkeeper, adapting the present offices for urinal, refitting water-closet for infants' teachers adjoining cloakroom, new fixed lavatories for teachers, channels to lavatories, &c., and new drainage scheme:—

Burn Bros.	£2,980 0	Johnson & Co., Ltd.	£2,540 0
Martin, Wells, & Co.	2,973 0	J. & C. Bowyer	2,492 0
Falkner & Sons	2,637 0	R. P. Beattie	2,457 19
		Johnson & Co.‡	2,416 0

The exteriors of the following schools will be painted between October 22 and November 17, 1900:—

FLEET-ROAD:—

Hodgson & Co.	£360 5 0	Marchant & Hirst	£229 0 0
Wall & Co.	253 0 0	Densham & Sons	215 0 0
F. Chidley	252 5 0	S. Polden	205 0 0
W. Chappell	250 0 0	T. Cruwys*	178 12 0
F. T. Chinchen	240 0 0		

HASELTINE-ROAD:—

J. & C. Bowyer	£221 0	G. Kemp	£184 0
E. Proctor	205 0	C. G. Jones	178 0
Somerford & Son	198 0	W. J. Howie	172 0
H. Groves	189 0	Hayter & Son*	158 17

HAVERSTOCK HILL:—

Hodgson & Co.	£352 1 0	W. Chappell	£198 10 0
Densham & Sons	275 0 0	J. W. Dixon	190 0 0
R. S. Buckeridge	271 0 0	Marchant & Hirst*	147 10 0
Wall & Co.	250 0 0		

LOWER CHAPMAN-STREET:—

J. Kybett	£265	Heard & Co.	£220 0
J. T. Robey	257	G. Barker	212 0
Gibb & Co.	253	S. H. Corfield	181 0
J. Haydon	239	G. Wales*	162 3
J. F. Holliday	236		

MARNER-STREET:—

J. F. Holliday	£221 0 0	Elkington & Sons	£180 0 0
Gibb & Co.	198 0 0	G. Wales	177 16 0
A. W. Derby	188 0 0	J. T. Robey*	168 0 0

MIDDLE-ROW:—

T. Cruwys	£198 0	W. Brown	£138 0
W. Hammond	179 10	W. Hornett	136 0
F. T. Chinchen	174 15	F. Chidley	134 4
R. S. Buckeridge	155 0	Bristow & Eatwell*	117 0
S. Polden	149 10		

MONNOW-ROAD:—

S. Musgrove	£249 19	W. J. Howie	£194
H. Line	249 0	H. J. Williams	194
E. Proctor	220 0	E. Triggs*	194
C. G. Jones	214 0		

MOWLEM-STREET:—

Barrett & Power	£160	Collis Willmott	£132
Silk & Son	160	Grover & Son	130
M. Pearson	150	G. Barker	128
J. Haydon	134	Snewin Bros. & Co.*	126

ST. JOHN'S-LANE:—

Gavin Bros.	£158 10	Williams & Son	£144 0
Johnson & Co.	153 0	M. Pearson*	120 0
G. Kirby	152 0		

SHEPPERTON-ROAD:—

E. Flood	£182	Williams & Son	£113
Goodman & Sons	124	Stevens Bros.	105
G. Kirby	115	J. Grover & Son*	103
McCormick & Sons	113		

SINGLE-STREET:—

J. Kybett	£260 10 0	Gibb & Co.	£162 0 0
Elkington & Sons	210 0 0	Snewin Bros. & Co.	148 0 0
J. T. Robey	196 0 0	S. H. Corfield*	143 0 0
Unsigned	188 0 0		
J. Haydon	188 0 0		

SOUTHAMPTON-STREET:—

W. V. Goad	£310 0 0	W. Smith	£238 0 0
Gregory & Co.	287 0 0	Maxwell Bros., Ltd.	237 0 0
W. Banks	286 11 6	Rice & Son	237 0 0
E. B. Tucker	269 0 0	Baylis & Francis*	232 0 0
H. Line	249 0 0		

WALNUT TREE-WALK:—

T. L. Green	£293	G. Brittain	£186
Holloway Bros.	227	J. Appleby	184
Lorden & Son	208	Lathey Bros.	179
Garrett & Son	199	J. F. Ford*	177
H. & G. Mallett	197		

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Buckingham Gate	64 0*	70 0	66 0 0
Central-street	18 5	17 0*	20 1 9
Fairfield-road	10 15	9 0*	10 0 0
George-street	13 12	14 5	10 6 0*
Gloucester-road	22 0	25 0	20 0 0*
Old Castle-street	15 10	14 0*	17 10 0

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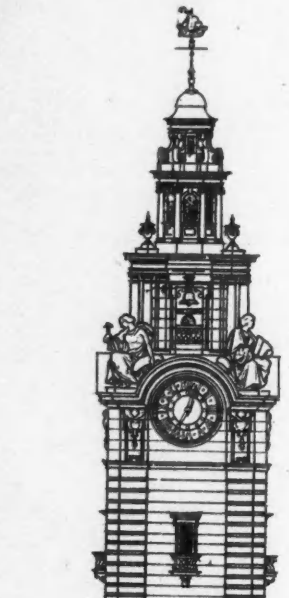
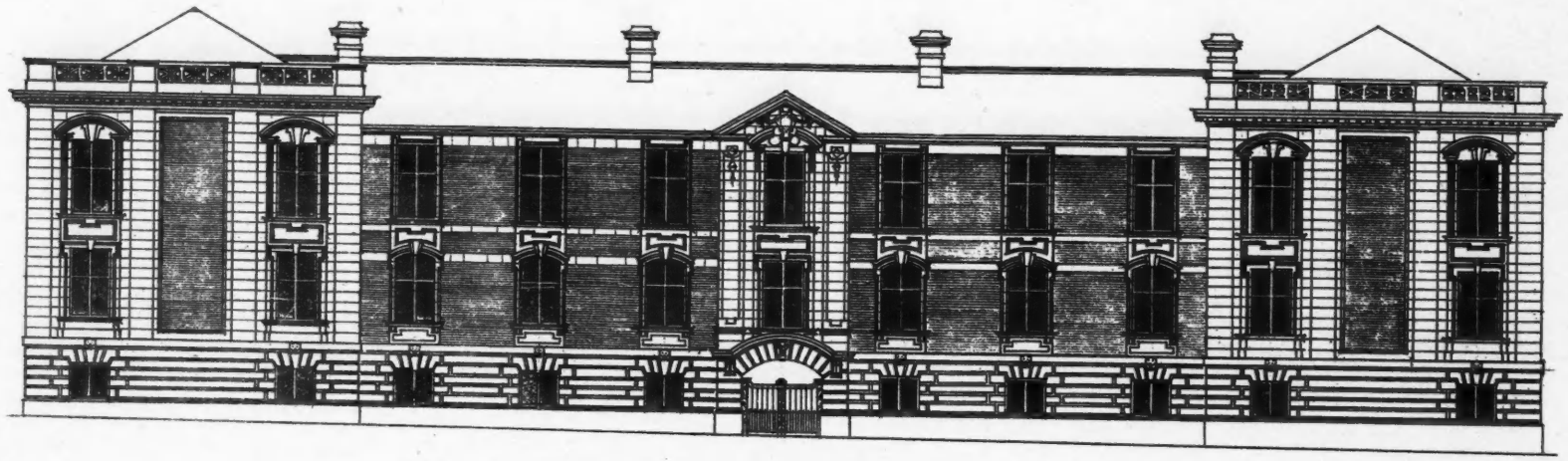
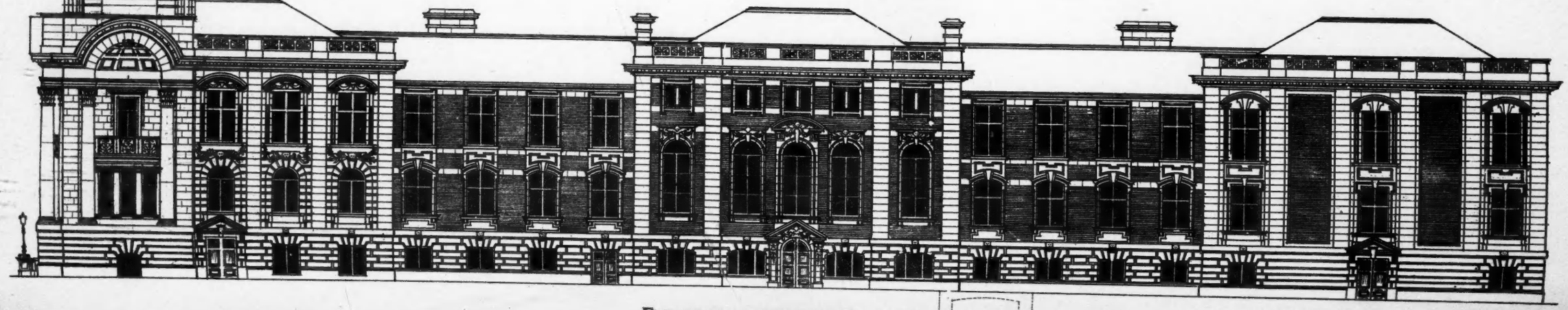
FINAL COMPETITION





ELEVATION TO DARWALL STREET

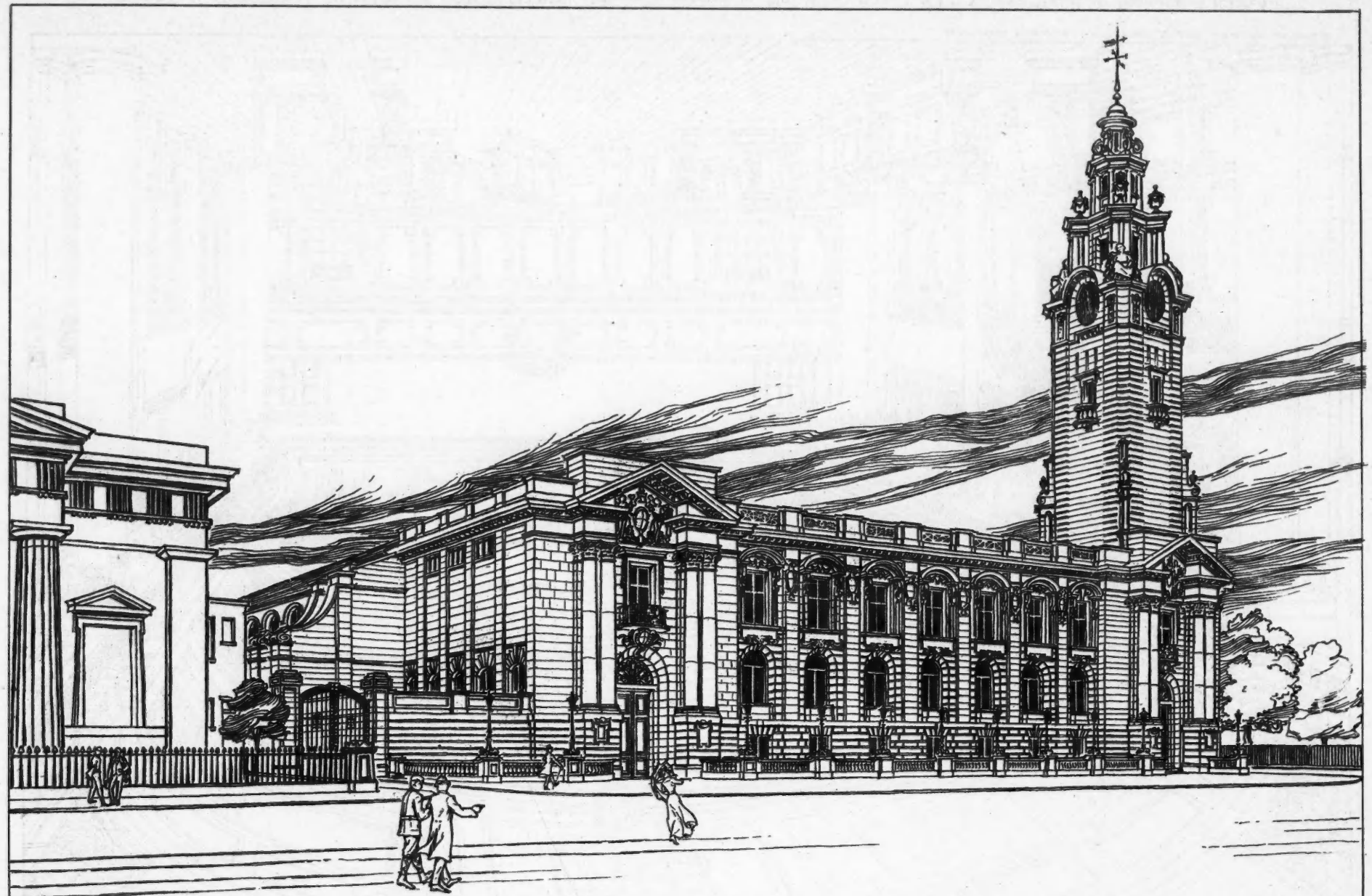
(AS IT WILL BE WHEN COMPLETE)



ELEVATION TO PROPOSED NEW STREET

SCALE OF FEET

SCALE OF FEET

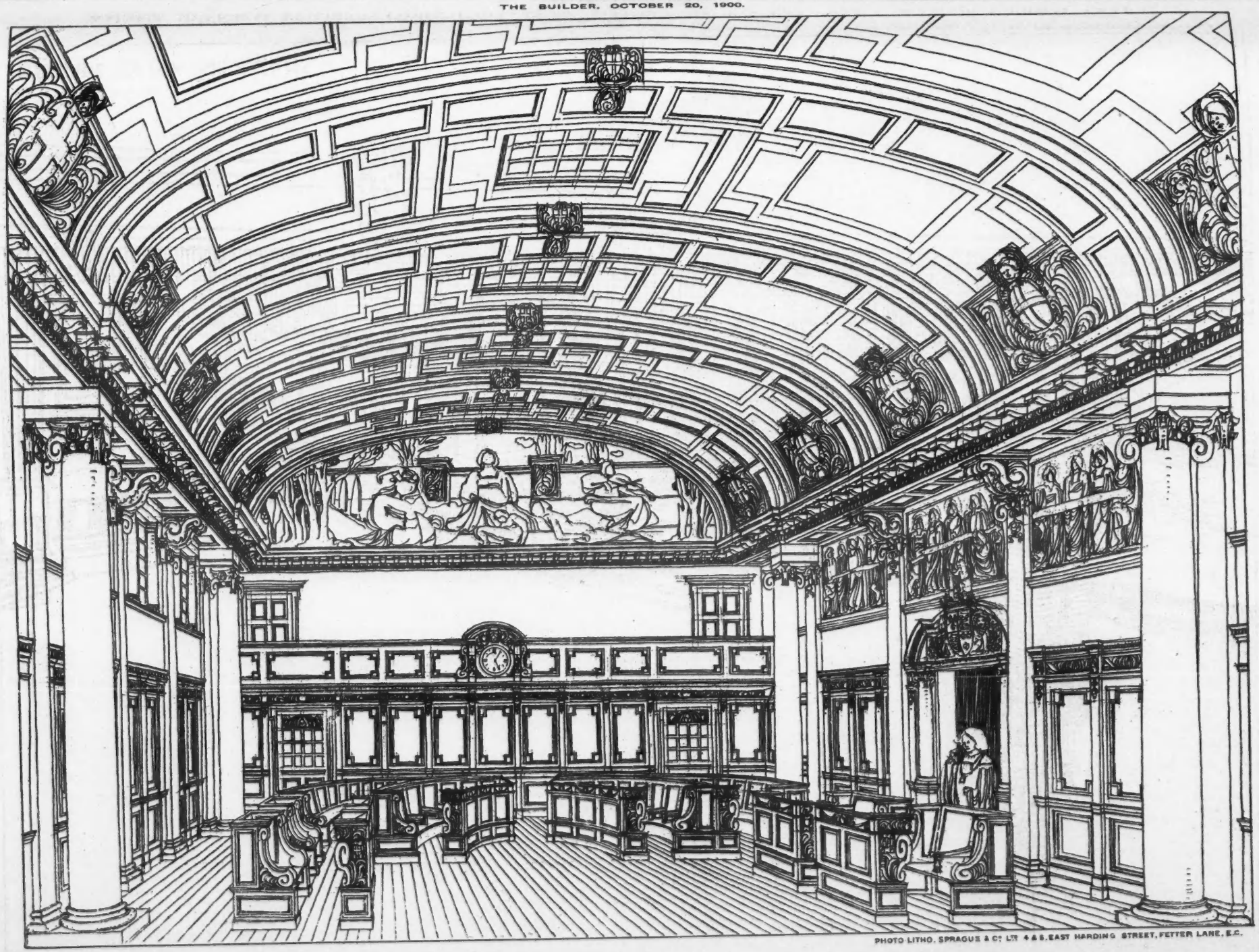


PERSPECTIVE VIEW FROM POINT ASKED FOR.

PHOTO-LITHO SPRAGUE & Co LTD 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

WALSALL MUNICIPAL BUILDINGS COMPETITION.—Design submitted by Mr. W. A. Pite, F.R.I.B.A., and Mr. R. S. Balfour, A.R.I.B.A.
EXTERIOR PERSPECTIVE.

WALSALL MUNICIPAL BUILDINGS COMPETITION.—Design submitted by Mr. W. A. Pite, F.R.I.B.A., and Mr. R. S. Balfour, A.R.I.B.A.
EXTERIOR PERSPECTIVE.



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WALSALL MUNICIPAL BUILDINGS COMPETITION.—Design submitted by Mr. W. A. Pite, F.R.I.B.A., and Mr. R. S. Balfour, A.R.I.B.A.
INTERIOR OF HALL.

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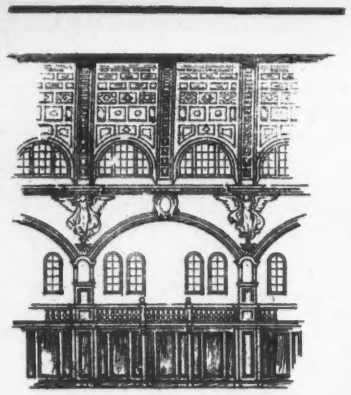
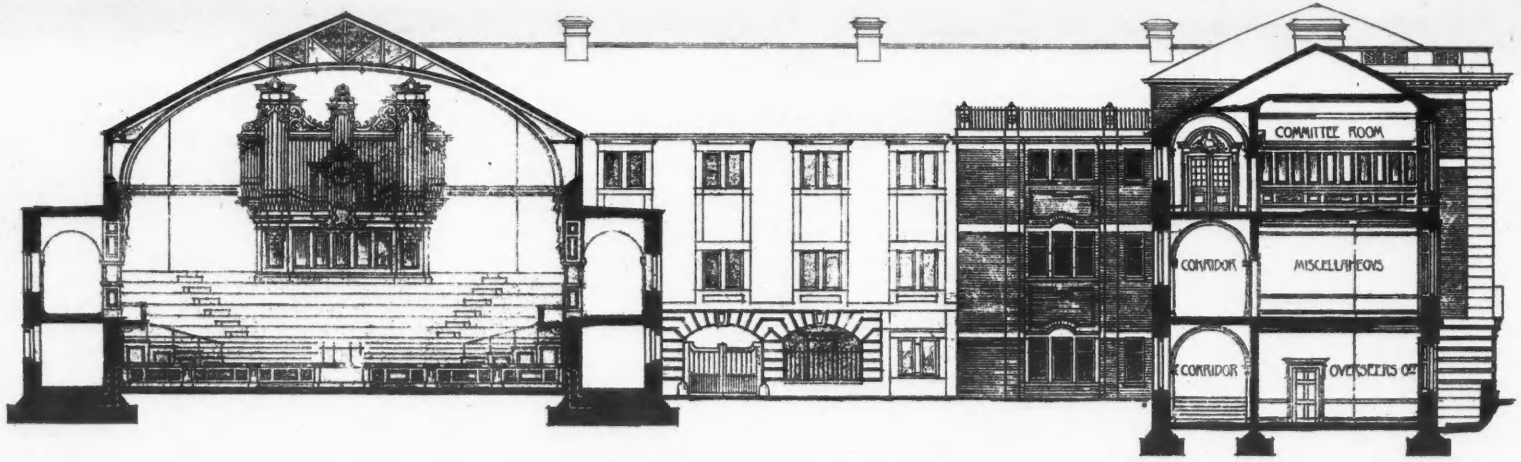
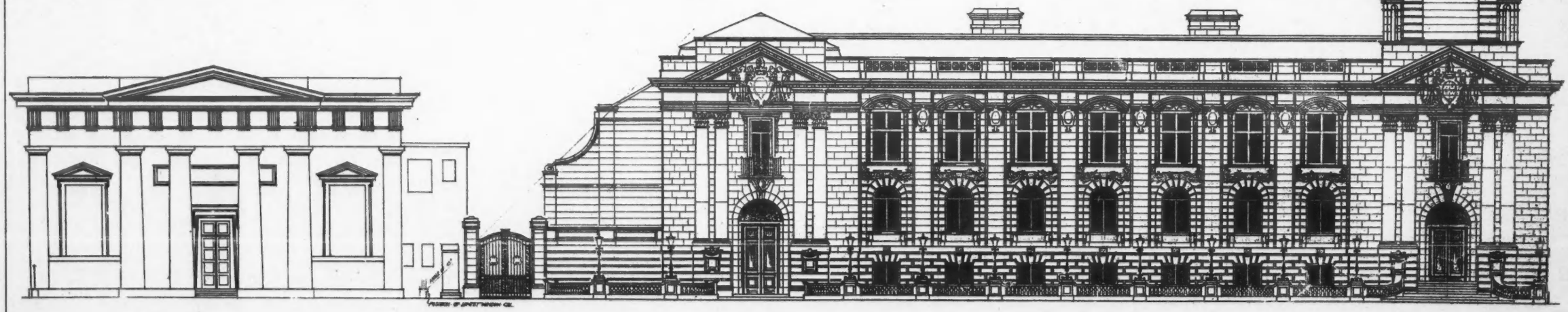


ELEVATION OF ONE BAY OF INTERIOR OF TOWN HALL



CROSS SECTION ON LINE A B



COUNTY COURT

ELEVATION TO LICHFIELD STREET

SCALE OF FEET 0 10 20 30 40 50 60 70 80 90

PHOTO-LITHO. SPRAGUE & Co LTD 4 & 5. EAST HARDING STREET, FETTER LANE. E.C.

WALSALL MUNICIPAL BUILDINGS COMPETITION.—Design submitted by Mr. W. A. Pite, F.R.I.B.A., and Mr. R. S. Balfour, A.R.I.B.A.

ELEVATIONS AND SECTION.

BOROUGH ENGINEER'S DEPT

GAS DEPT

POST OFFICE

PICTURE GALLERY

PICTURE GALLERY

SCULPTURE GALLERY

PICTURE GALLERY

DIVORCE ROOM

COUNTY COURT

FUTURE EXTENSION

BOROUGH ENGINEER'S DEPT

BUILDING INSPECTOR

FOREMAN'S OFFICE

TESTING & SAMPLES RM

BOROUGH ENGINEER

GENERAL OFFICE

ORGAN

CHORUS

ORCHESTRA

PLATFORM

UPPER PART OF TOWN HALL

ACCOMODATION OF HALL

AREA	998
GALLERIES	512
TOTAL	1510
ORCHESTRA	300
CHORUS	

SUGGESTED FUTURE EXTENSION

SUGGESTED FUTURE EXTENSION

SUGGESTED FUTURE EXTENSION

GALLERY

PLANT

STRONG ROOM

ASSISTANT SURVEYOR

BOROUGH ACCTS

CLERKS

STRONG RM

COLLECTOR'S OFFICE

STRONG ROOM

MISCELLANEOUS

PORTER'S TABLE

ENTRANCE HALL

TOWN CLERK'S OFFICE

STRONG ROOM

MUNICIPAL BUILDINGS ENTRANCE

TOWN CLERK'S DEPT

BOROUGH ACCOUNTANT'S DEPT

BOROUGH ENGINEER'S DEPT

GROUND FLOOR PLAN

FUTURE EXTENSION

GAS DEPT

ORGAN

UPPER PART OF TOWN HALL

SUGGESTED FUTURE EXTENSION

SUGGESTED FUTURE EXTENSION

COUNCIL CHAMBER

BOROUGH ENGINEER'S DRAWING OFFICE

PLANS STRONG ROOM

SPARE

ELEC. ENGR

ELEC. ENGR CLERKS

SPARE RM

UPPER PART COLLECTOR'S OFFICE BOROUGH ACCOUNTANT

ELEC ENG'RS DEPT

BOROUGH ENGINEER'S DEPT

MUNICIPAL OFFICES

MUNICIPAL OFFICES

FIRST FLOOR PLAN

SCALE OF FEET

DARWALL STREET

POST OFFICE

FUTURE EXTENSION

ARCHWAY

GAS DEPT

FEMALE CHORUS

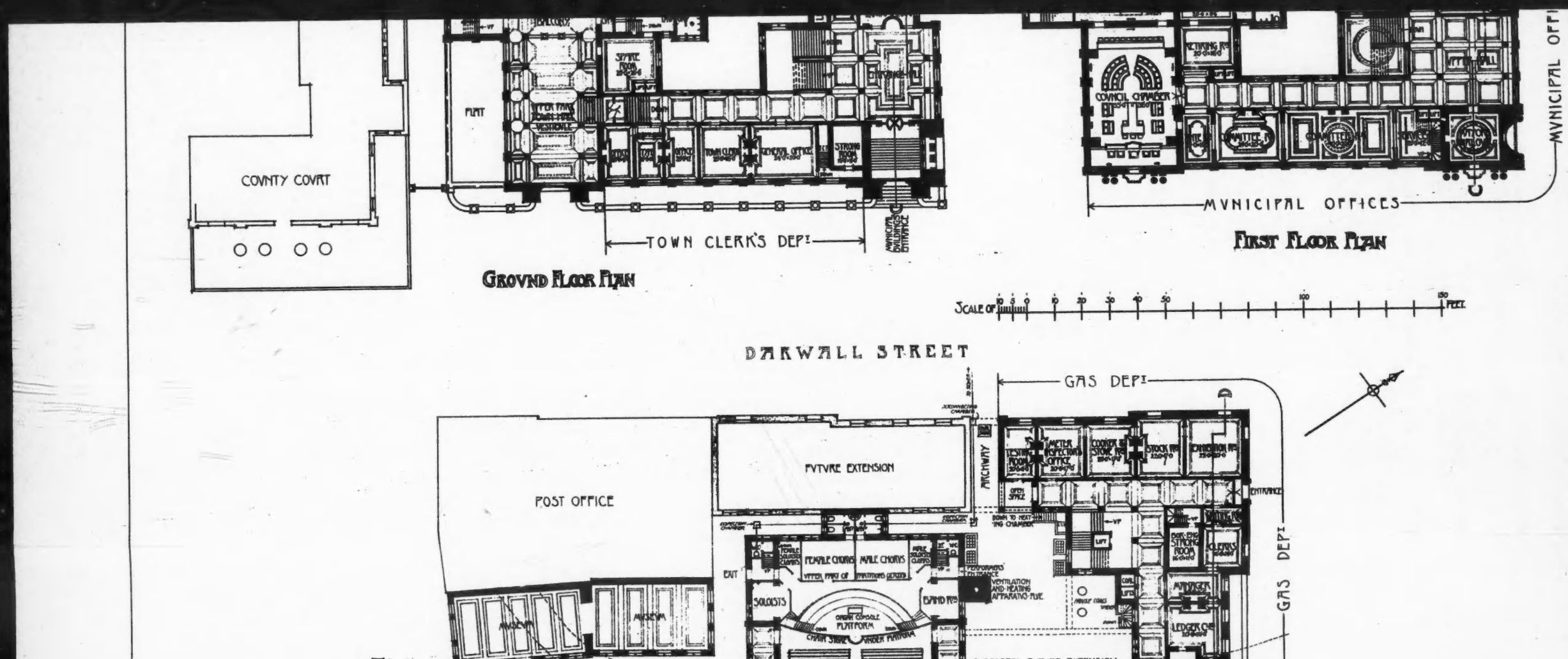
MALE CHORUS

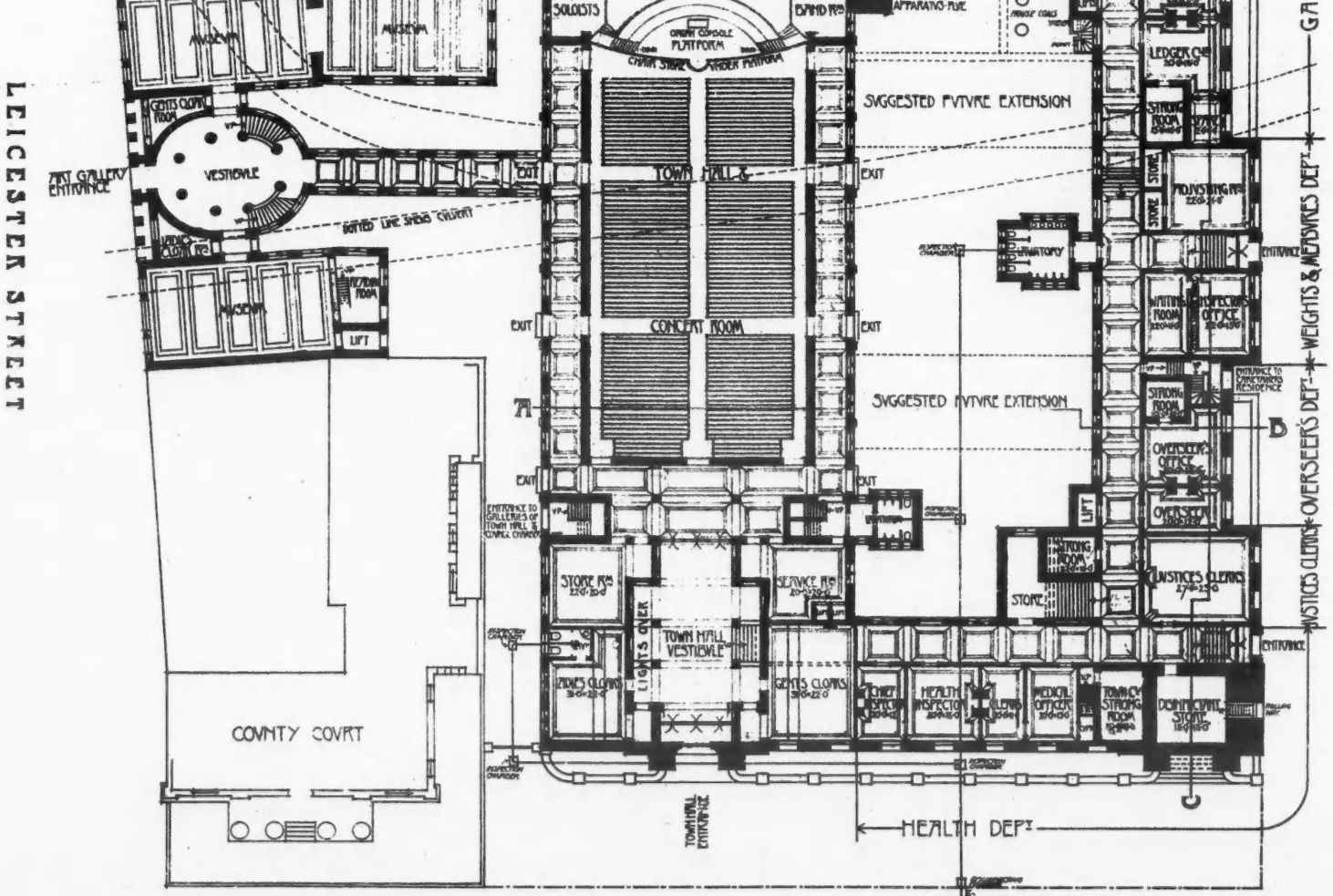
ENTRANCE

EXIT

VENTILATION

ENTRANCE


COVNTY COVRT
TOWN CLERK'S DEPT
MVNICIPAL OFFICES
MVNICIPAL OFFICES
GROVND FLOOR PLAN
FIRST FLOOR PLAN
SCALE OF FEET
DARWALL STREET
POST OFFICE
FVTVRE EXTENSION
GAS DEPT
SUGGESTED FVTVRE EXTENSION
MVSEVM
COVNCIL CHAMBER
ENTRANCE
ENTRANCE HALL
PLANT



BASEMENT FLOOR PLAN

INK-PHOTO. SPRAGUE & Co LTD 9 & 5, EAST HARDING STREET, FETTER LANE, E.C.

WALSALL MUNICIPAL BUILDINGS COMPETITION.—DESIGN SUBMITTED BY MR. W. A. PITE, F.R.I.B.A., AND MR. R. S. BALFOUR, A.R.I.B.A.

PLANS.

I.

II.

IV.

V.

VI.

VII.

V.

II.

II.

III.

VII.

VIII.

SKETCH-DESIGNS FOR TAPESTRY PATTERNS

'00.

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